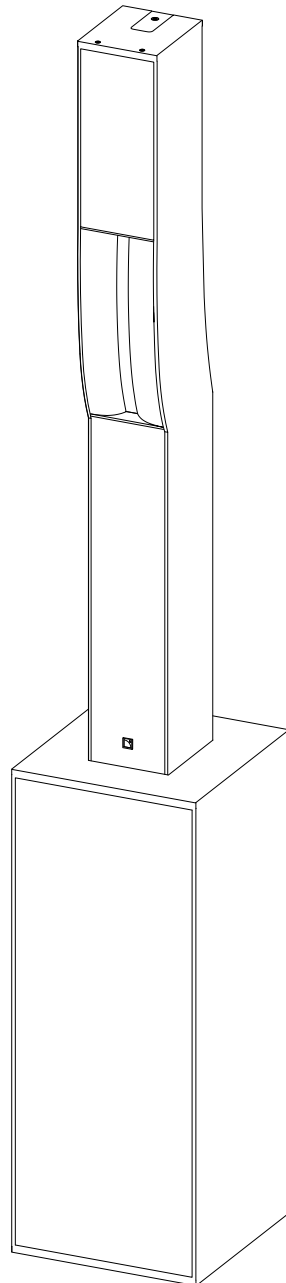


SYVA



user manual (EN)



Document reference: Syva user manual (EN) version 1.0

Distribution date: June 7, 2017

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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.
- 
This system is intended for professional use.
- 
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 indicates a potential risk of electrical injury.
 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 Syva.

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.

Syva Colinear Source

Syva is a Colinear Source system (patent pending) suited to medium throw applications. It is designed for professional sound reinforcement and high-end residential applications requiring high fidelity and SPL with minimum visual impact.

The Syva enclosure features six 5" MF speakers providing usable bandwidth down to 87 Hz and three 1.75" HF diaphragm compression drivers, loaded by DOSC waveguides in a J-shaped progressive curvature. This transducer arrangement, called Colinear Source, produces an H/V 140° x 26° (+5°/-21°) directivity pattern, optimized for ultra-wide horizontal coverage with extended throw capability.

The Syva Low enclosure features two K2 12" drivers and is designed to provide low frequency contour and extended bandwidth to the Syva system (9 dB contour with a low frequency limit at 40 Hz).

The Syva Sub enclosure features one high excursion 12" driver equipped with a KS28 woofer motor and is designed to further extend the bandwidth of the system in the sub frequency domain down to 27 Hz.

Both feature a bass-reflex cabinet equipped with L-Vents, reducing turbulence and port noise at high levels while increasing LF efficiency.

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

Syva combines the directivity benefits of line length and the coupling of HF DOSC waveguides to achieve a narrow vertical beam that is perfectly controlled down to 300 Hz. Syva focuses energy toward the back of the audience while providing smooth down-fill coverage to the front. Throw and SPL consistency are ensured from front, to back. The combination of extended 35 m throw and ultrawide horizontal dispersion provides exceptional surface coverage for flat audiences.

The cabinet combines the remarkable acoustic properties of birch and beech plywood. Its slim elegance makes for easy integration. RAL colors allow it to blend into any architecture. Syva Low and Syva Sub provide a stable podium base for Syva. The plug-and-play AutoConnect provides a rapid and secure audio and physical link.

In fixed installations Syva is particularly suited to sound reinforcement in architectural settings and acoustically challenging environments where a combination of high intelligibility, high SPL and extended bandwidth are required. Its high fidelity sonic signature and elegant lines can satisfy high-end residential projects as well as L-ISA immersive multi-channel systems.

For rental events, Syva is fast to deploy and simple to rig. Its outstanding throw capability can satisfy production needs in large spaces and ballrooms where elegance and discretion are a must.

Syva can be stacked as a standalone system or secured onto one of its LF extensions. Wall-mounting and flying are also possible.

System components

Loudspeaker enclosures

Syva	2-way-passive enclosure: 6 x 5" LF + 3 x 1.75" HF diaphragm
Syva Low	High power low frequency subwoofer: 2 x 12" LF
Syva Sub	Infra low frequency subwoofer: 1 x 12" LF

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
L-CASE	2U Electronics transport and protection case



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

Loudspeaker cables

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)
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
DOFILL-LA8	breakout cable for two 2-way active enclosures (4 mm ² gauge) 8-point PA-COM to 2 x 4-point speakON
DOSUB-LA8	breakout cable for four passive enclosures (4 mm ² gauge) 8-point PA-COM to 4 x 2-point speakON
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
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)



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 Syva rigging manual.

Software applications

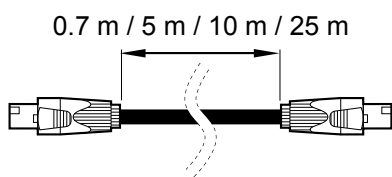
Soundvision 3D acoustical and mechanical modeling software

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

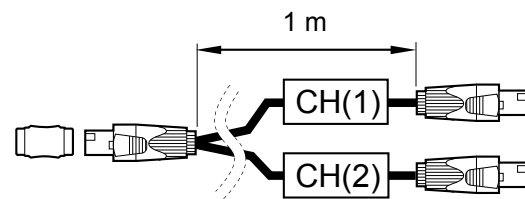
i Refer to the **Soundvision** help.

i Refer to the **LA Network Manager video tutorial**.

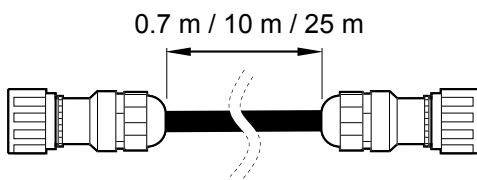
Loudspeaker cables



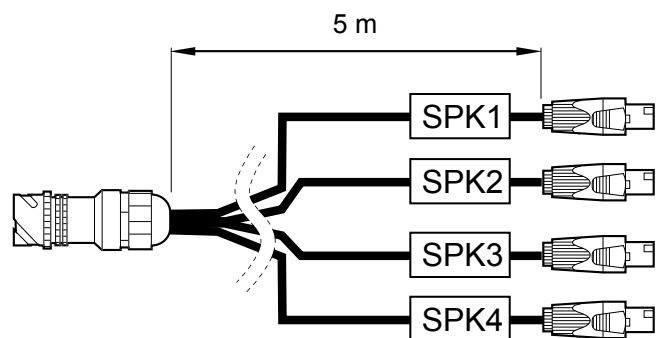
SP.7 / SP5 / SP10 / SP25



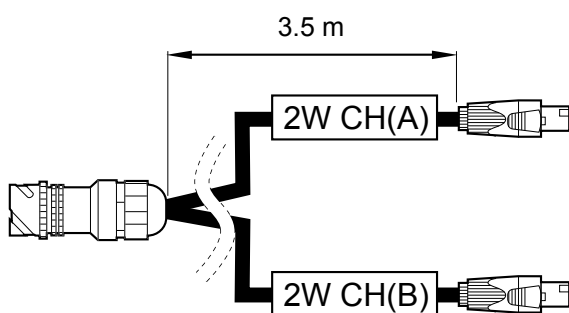
SP-Y1



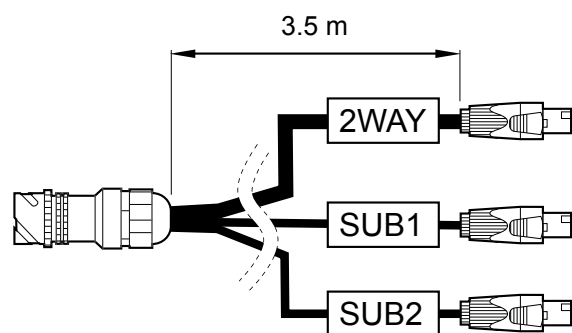
DO.7 / DO10 / DO25



DOSUB-LA8



DOFILL-LA8

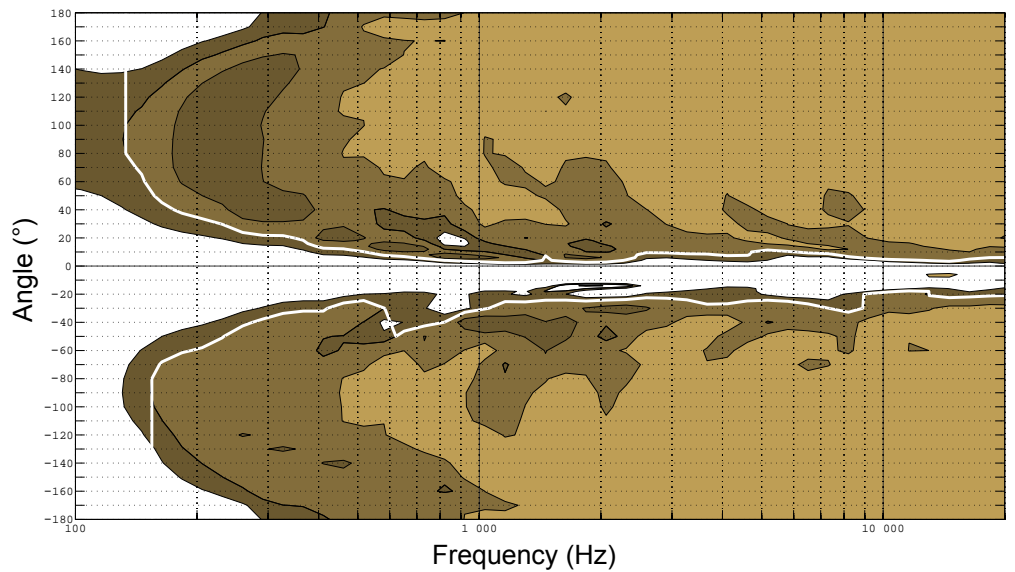
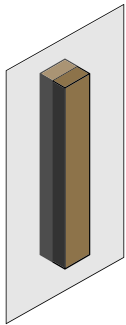
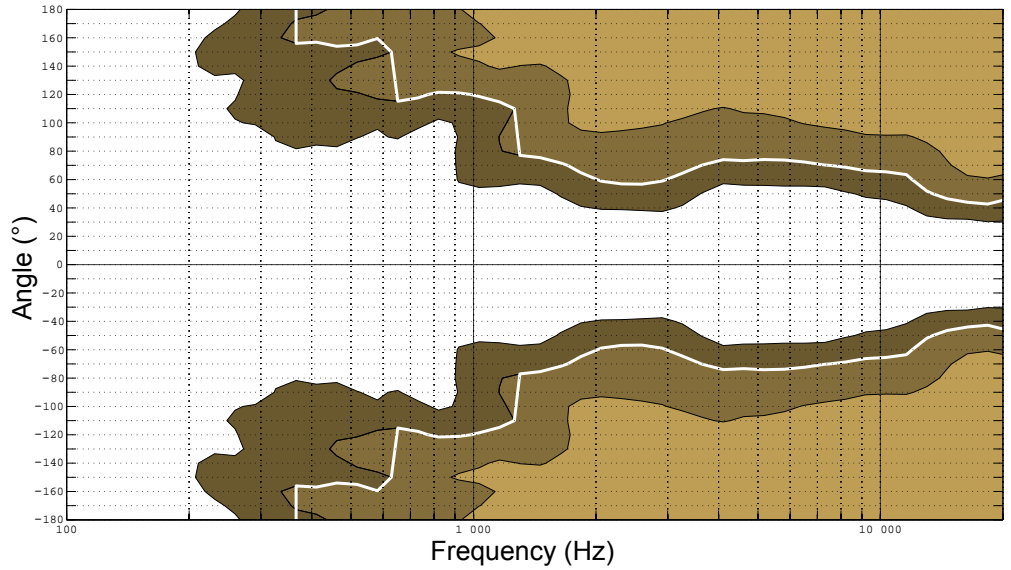
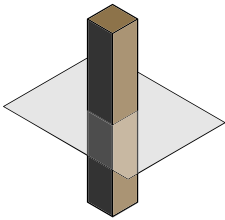


DO3WFILL

Technical description

Directivity

Syva generates a horizontal directivity pattern of 140° (>1 kHz) and a vertical directivity pattern between +5° and -21° in J-shape (> 1 kHz).



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

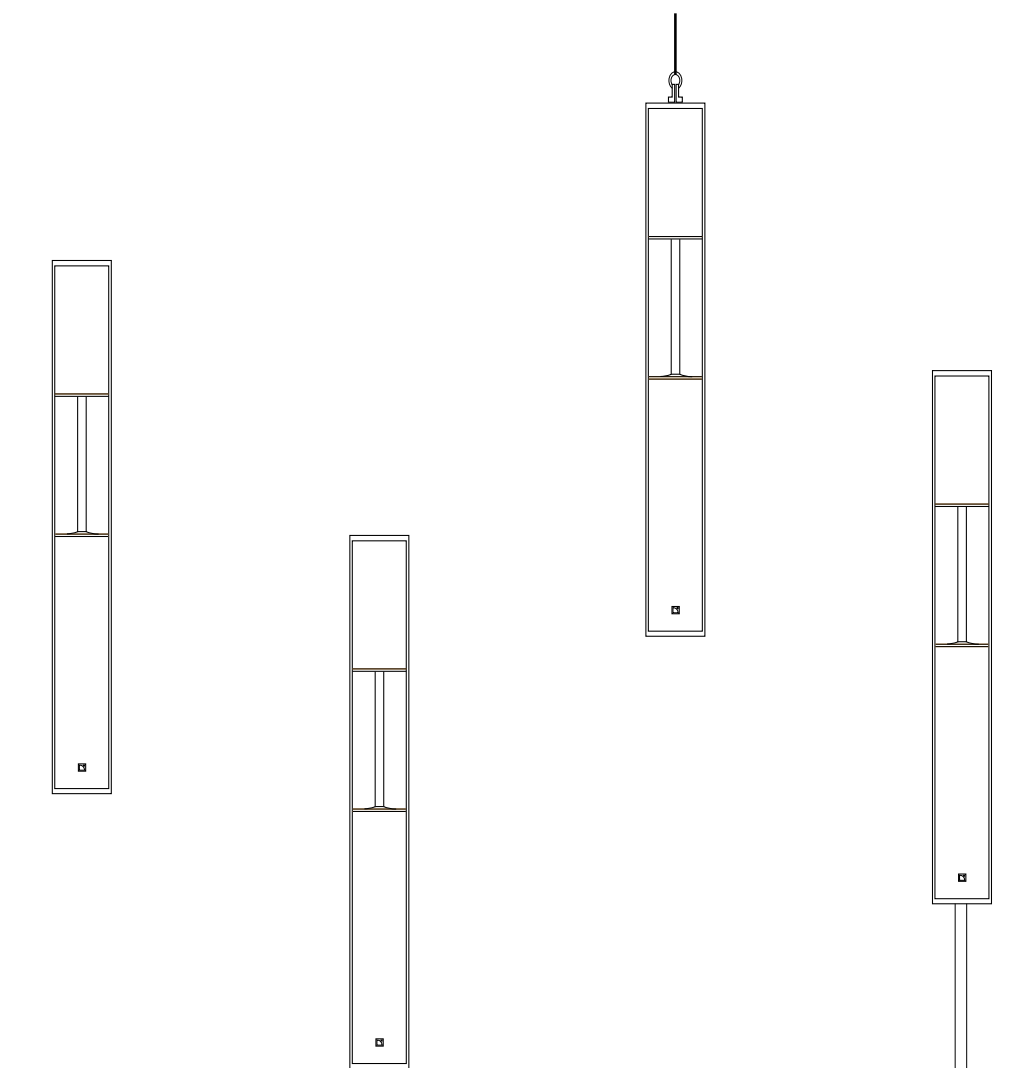
Loudspeaker configurations

Syva colinear source

In this configuration the system operates over the nominal bandwidth of the enclosure.

The [SYVA] preset allows for a reference frequency response in medium throw applications.

Syva is driven by the LA4X / LA8 / LA12X amplified controllers.



Preset	[SYVA]
Frequency range (-10 dB)	87 Hz - 20 kHz

Syva colinear source with LF extension

In hybrid configuration with Syva Low, the Syva system bandwidth is extended down to 40 Hz and the system contour is reinforced by 9 dB.

Syva and Syva Low are driven by the LA4X / LA8 / LA12X amplified controllers.

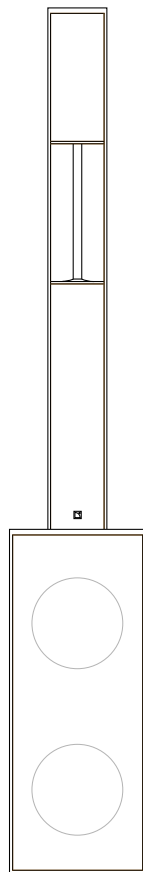
Coupled

The [SYVA LOW SYVA] hybrid preset enables acoustic coupling when Syva is on top of Syva Low (AutoConnect) or within a 60 cm (24 in) distance.

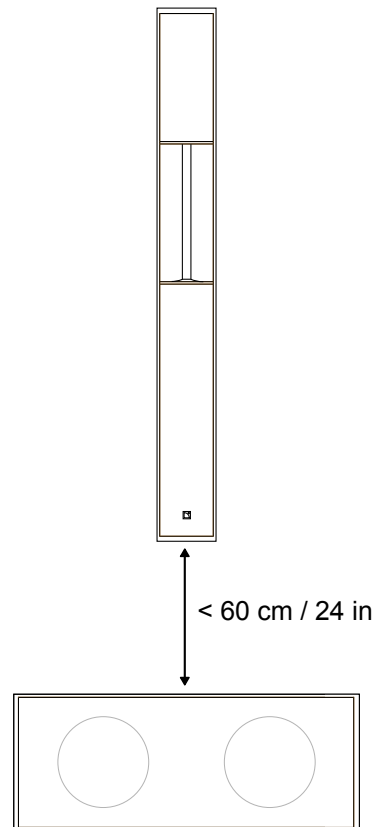


To use [SYVA LOW SYVA], connect Syva and Syva Low to the same amplified controller output.

Use Autoconnect or an SP-Y1 cable. Refer to [Connecting hybrid configurations](#) (p.17) for LA4X and [Connecting hybrid configurations](#) (p.19) for LA8 or LA12X.



with AutoConnect



without AutoConnect

Enclosures	Syva	Syva Low
Preset	[SYVA LOW SYVA]	
Frequency range (-10 dB)	40 Hz - 20 kHz	

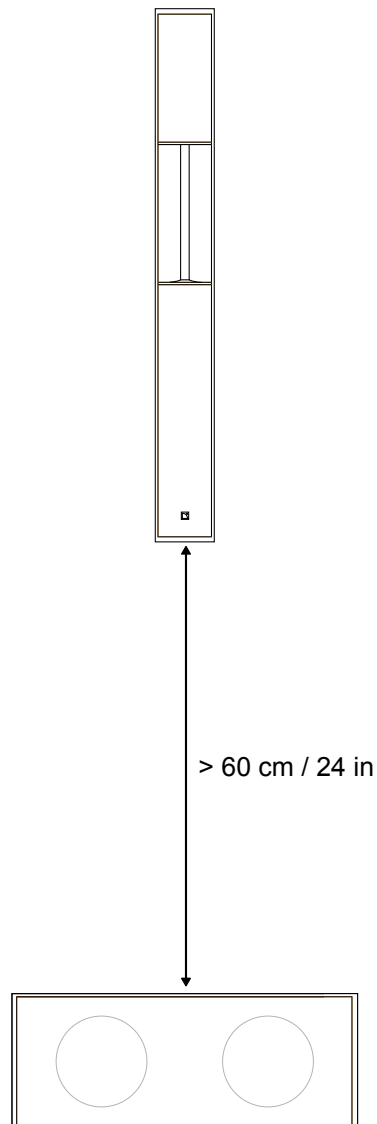


No pre-alignment delay values are required for the Syva system.

Separated

The [SYVA] preset allows for a reference frequency response in medium throw applications.

The [SYVA LOW_100] preset provides Syva Low with an upper frequency limit at 100 Hz.



Enclosures	Syva	Syva Low
Preset	[SYVA]	[SYVA LOW_100]
Frequency range (-10 dB)	40 Hz - 20 kHz	

! Do not forget to add the geometric delays depending on the configuration.

i No pre-alignment delay values are required for the Syva system.


Syva colinear source with LF extension and subwoofer

With Syva Sub, the Syva system bandwidth is extended down to 27 Hz.

Syva, Syva Low and Syva Sub are driven by the LA4X / LA8 / LA12X amplified controllers.

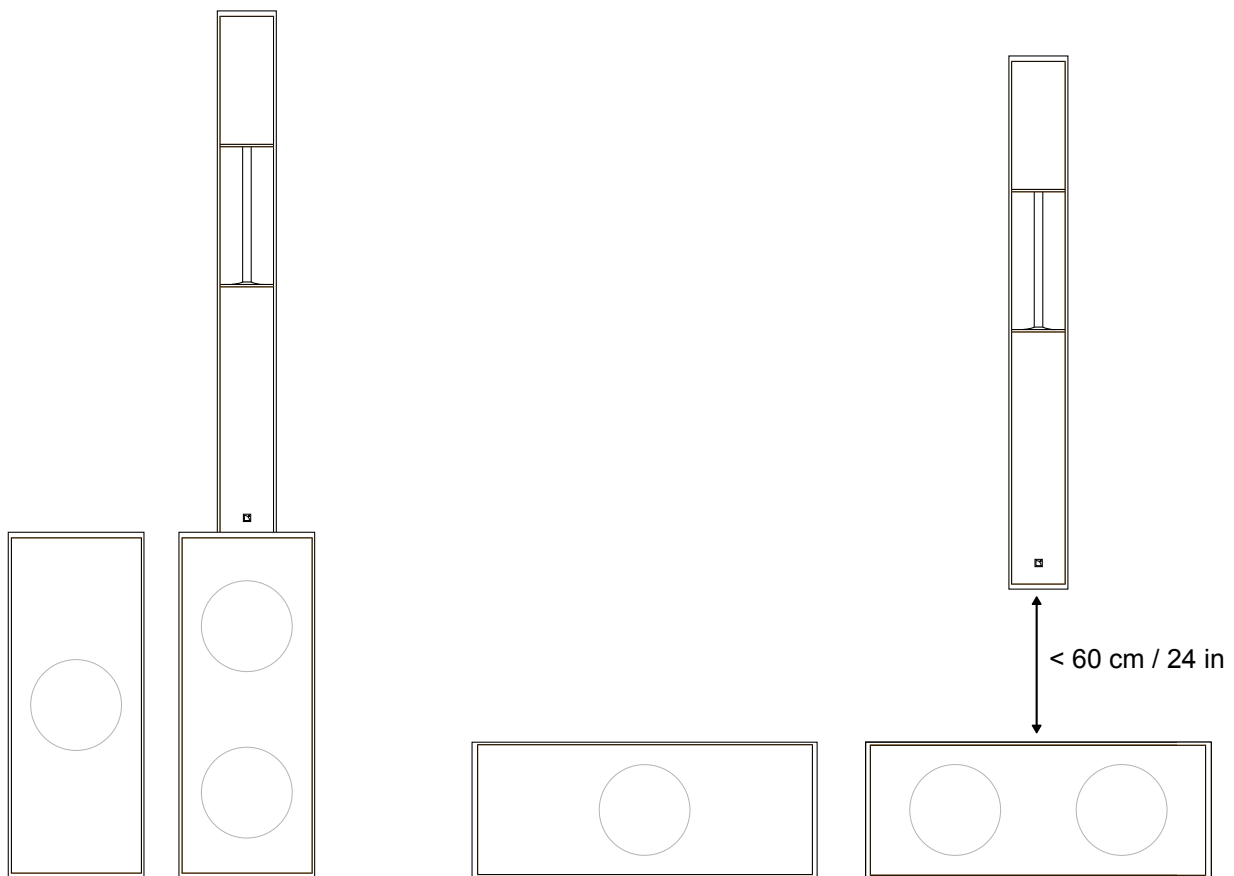
Coupled

The [SYVA LOW SYVA] hybrid preset enables acoustic coupling when Syva is on top of Syva Low (AutoConnect) or within a 60 cm (24 in) distance.




-  **To use [SYVA LOW SYVA], connect Syva and Syva Low to the same amplified controller output.** Use Autoconnect or an SP-Y1 cable. Refer to [Connecting hybrid configurations](#) (p.17) for LA4X and [Connecting hybrid configurations](#) (p.19) for LA8 or LA12X.

The [SYVA SUB_100] preset provides Syva Sub with an upper frequency limit at 100 Hz.

-  **[SYVA SUB_100] polarity is reversed to optimize Syva Sub acoustic summation with Syva/Syva Low.**



Enclosures	Syva	Syva Low	Syva Sub
Presets	[SYVA LOW SYVA]		[SYVA SUB_100]
Frequency range (-10 dB)	27 Hz - 20 kHz		

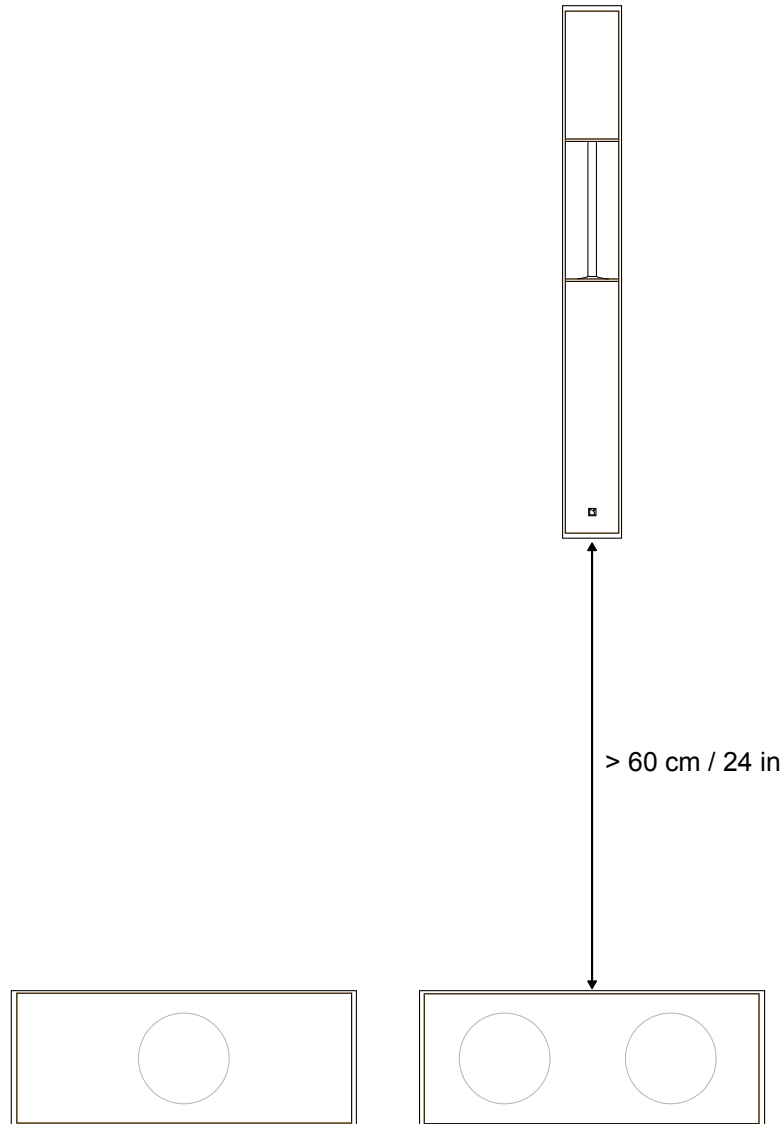
-  **Grouping subwoofers**
Place the subwoofer enclosures side by side. If not possible, the maximum distance between two adjacent acoustic centers must be 1.7 m if the upper frequency limit of the subwoofer system is at 100 Hz.
-  Do not forget to add the geometric delays depending on the configuration.
-  No pre-alignment delay values are required for the Syva system.

Separated

The [SYVA] preset allows for a reference frequency response in medium throw applications.

The [SYVA LOW_100] and [SYVA SUB_100] presets provide Syva Low and Syva Sub with an upper frequency limit at 100 Hz.

i [SYVA SUB_100] polarity is reversed to optimize Syva Sub acoustic summation with Syva/Syva Low.



Enclosures	Syva	Syva Low	Syva Sub
Presets	[SYVA]	[SYVA LOW_100]	[SYVA SUB_100]
Frequency range (-10 dB)	27 Hz - 20 kHz		

! Grouping subwoofers

Place the subwoofer enclosures side by side. If not possible, the maximum distance between two adjacent acoustic centers must be 1.7 m if the upper frequency limit of the subwoofer system is at 100 Hz.

! Do not forget to add the geometric delays depending on the configuration.

i No pre-alignment delay values are required for the Syva system.

Loudspeaker connection

Connectors

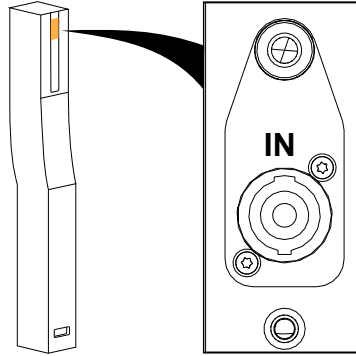
Syva

Syva offers multiple types of connectors. Use **one** type of connector at a time.

Use the **speakON connector** to connect the enclosure with an SP cable.



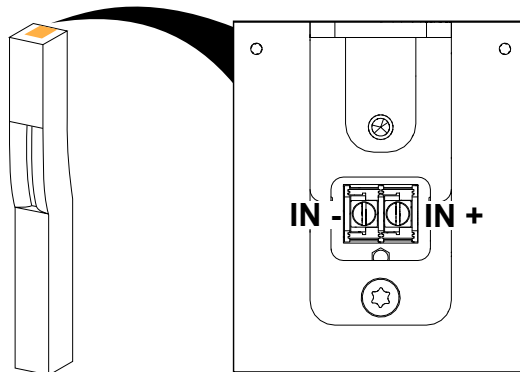
The speakON connector is only accessible if Syva Wall is used with a wedge.
Refer to the Syva rigging manual.



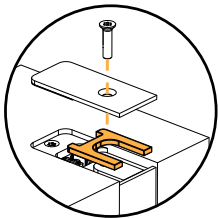
Use the **screw terminal** to connect the enclosure with speaker wire.



Put the cover back on the connector once the wire is installed.



When the screw terminal is not in use, put the gasket back to avoid leaks.



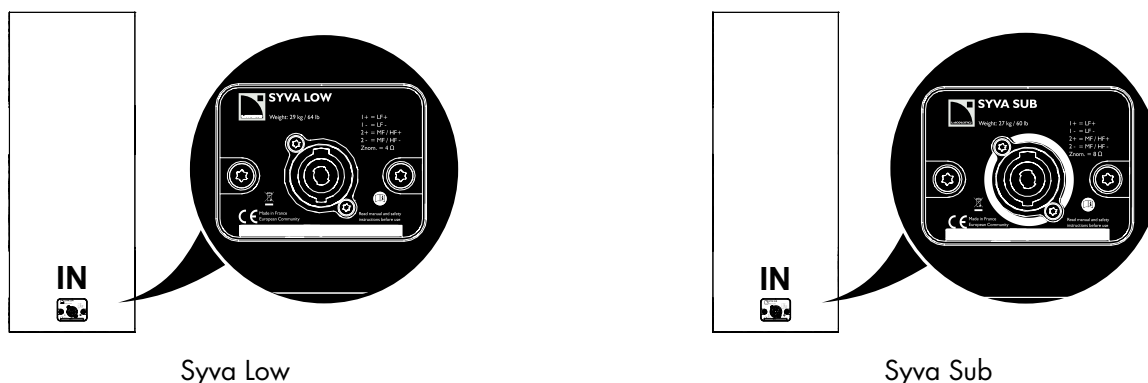
Internal pinout for L-Acoustics 2-way passive enclosures

screw terminal points	IN +	IN -	/	/
speakON points	1 +	1 -	2 +	2 -
transducer connectors	+	-	Not linked	Not linked

Syva Low and Syva Sub

Syva Low and Syva Sub are equipped with one 4-point speakON connector.

Use the labels to differentiate the subwoofers.



Syva Low

Syva Sub

Internal pinout for L-Acoustics subwoofers

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

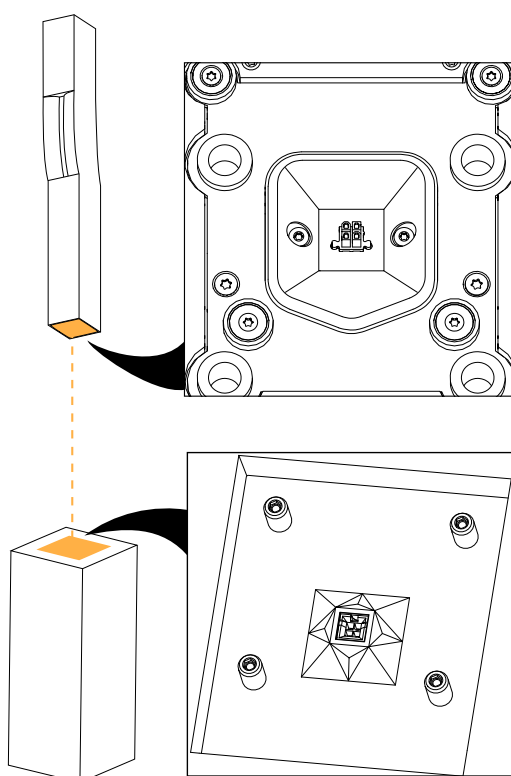
Syva combined with Syva Low



Amplified controller damage

Do not use the speakON connector or screw terminals on Syva when using AutoConnect.

With Syva on top of Syva Low, AutoConnect is enabled and power is routed through the subwoofer connector plate to the enclosure.



AutoConnect internal pinout

AutoConnect points	1 +	1 -	2 +	2 -
Transducer connectors	LF +	LF -	MF/HF+	MF/HF-

Connection to LA4X

Maximum number of enclosures per LA4X

enclosure	max enclosures in parallel	max enclosures per controller
Syva	1	4
Syva Low	1	4
Syva Sub	1	4

Impedance load

Syva Syva Sub

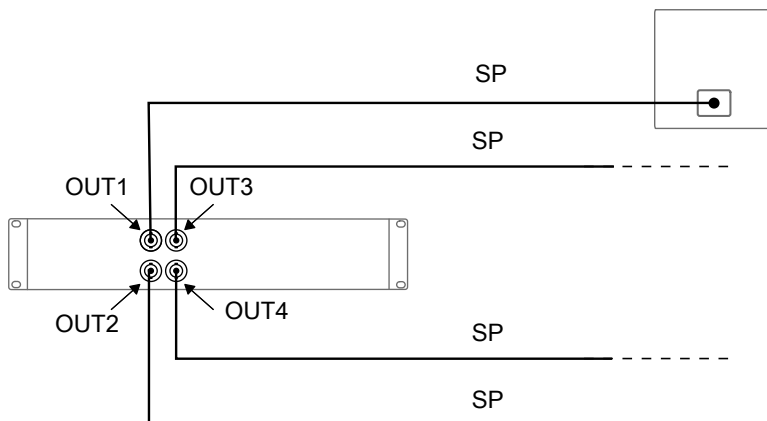
1 enclosure: 8 Ω

Syva Low

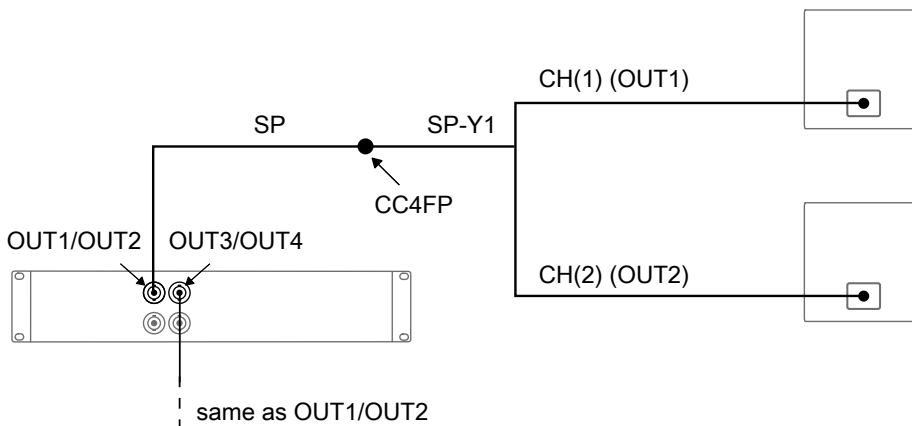
1 enclosure: 4 Ω

Connecting 2-way passive enclosures or subwoofers

SP on speakON output



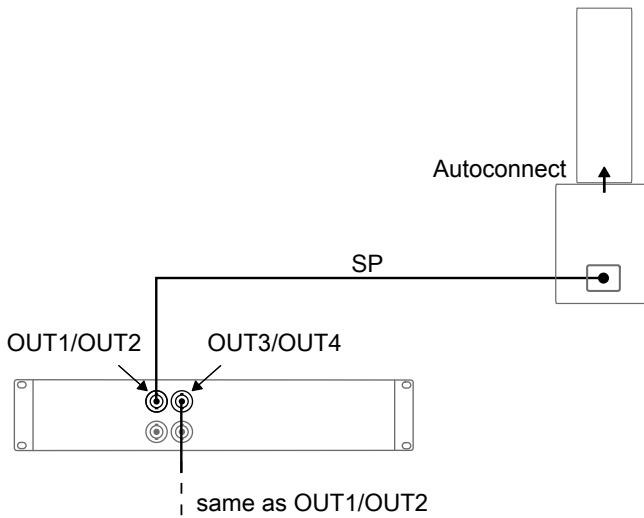
SP and SP-Y1 on speakON output



Connecting hybrid configurations

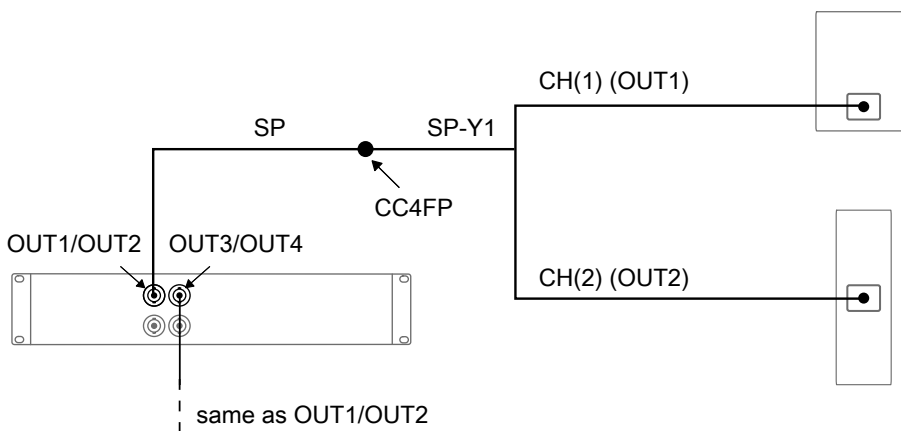
! Use [SYVA LOW SYVA] with these cabling schemes.

SP on speakON output



SP and SP-Y1 on speakON output

! **Risk of damaging the Syva drivers.**
Connect CH(1) to Syva Low and CH(2) to Syva.



Connection to LA8

Maximum number of enclosures per LA8

enclosure	max enclosures in parallel	max enclosures per controller
Syva	2	8
Syva Low	1	4
Syva Sub	2	8

Impedance load

Syva Syva Sub

1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

Syva Low

1 enclosure: 4 Ω

Connection to LA12X

Maximum number of enclosures per LA12X

enclosure	max enclosures in parallel	max enclosures per controller
Syva	3	12
Syva Low	2	6
Syva Sub	3	12

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

LA12X can drive up to two Syva Low per output, but no more than six per controller.

Impedance load

Syva Syva Sub

1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

3 enclosures in parallel: 2.7 Ω

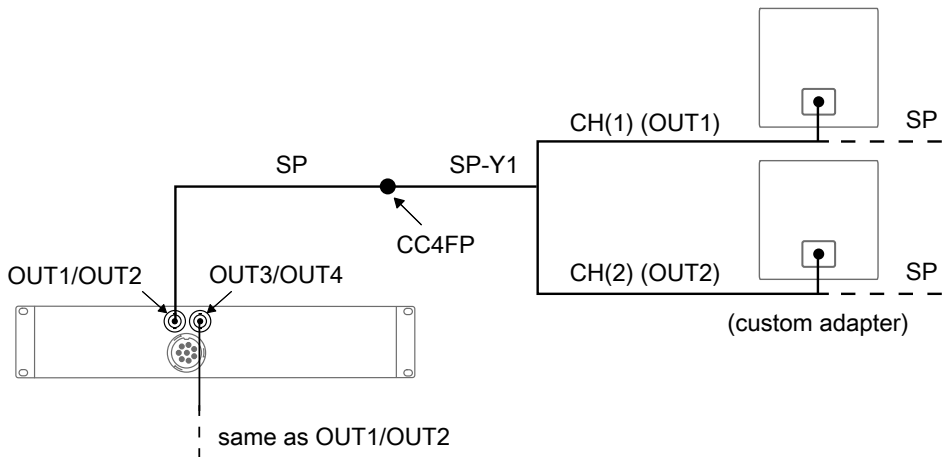
Syva Low

1 enclosure: 4 Ω

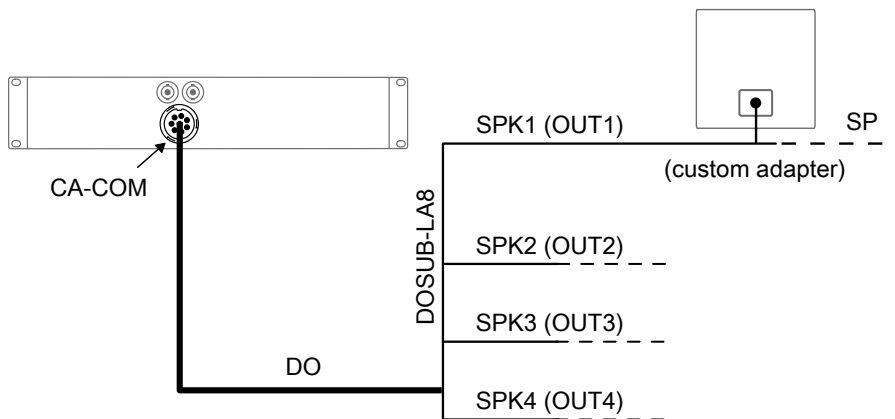
2 enclosures in parallel: 2 Ω

Connecting 2-way passive enclosures or subwoofers

SP and SP-Y1 on speakON output



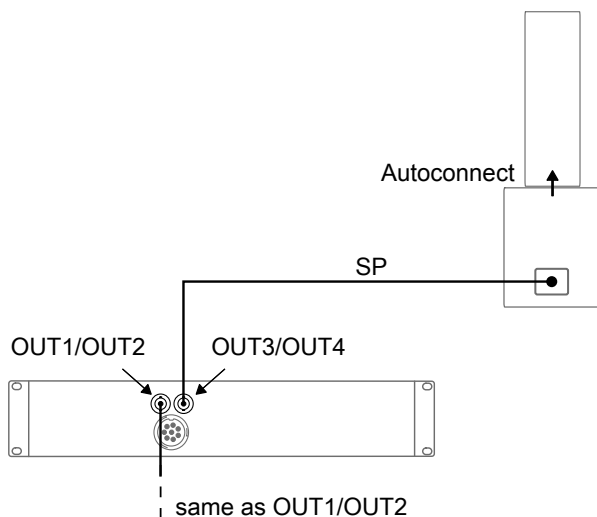
DO and DOSUB-LA8 on CA-COM output



Connecting hybrid configurations

! Use [SYVA LOW SYVA] with these cabling schemes.

SP on speakON output

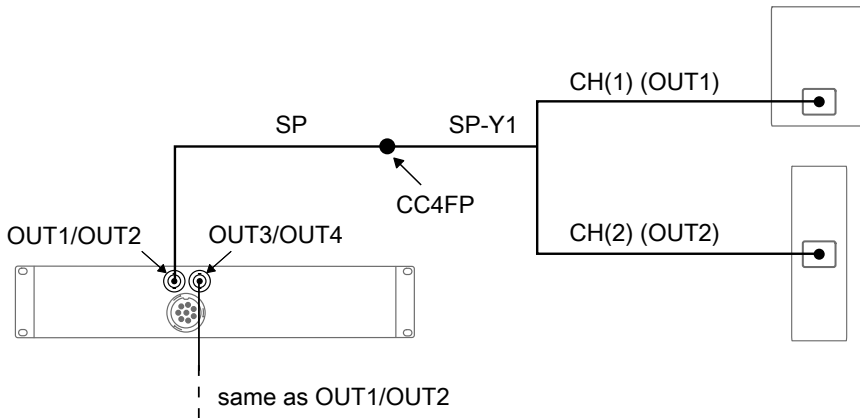


SP and SP-Y1 on speakON output

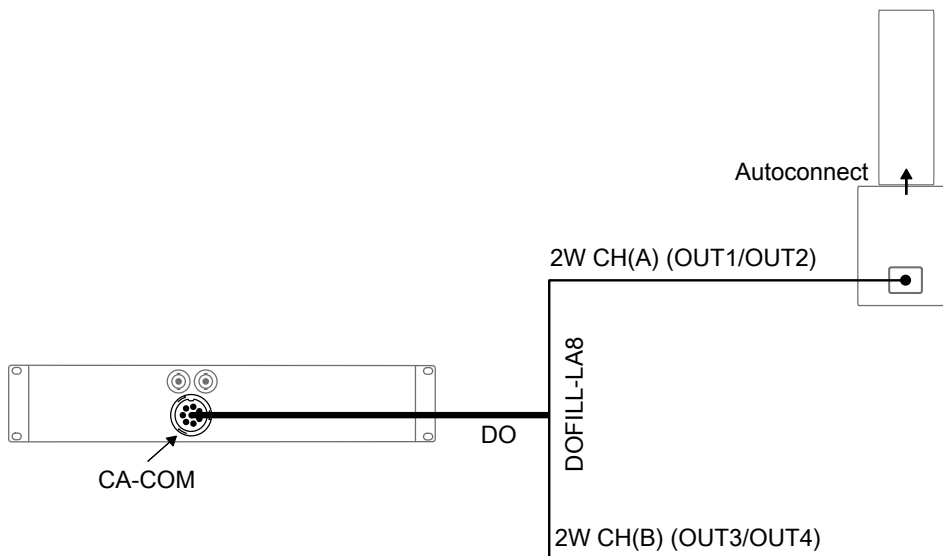


Risk of damaging the Syva drivers.

Connect CH(1) to Syva Low and CH(2) to Syva.

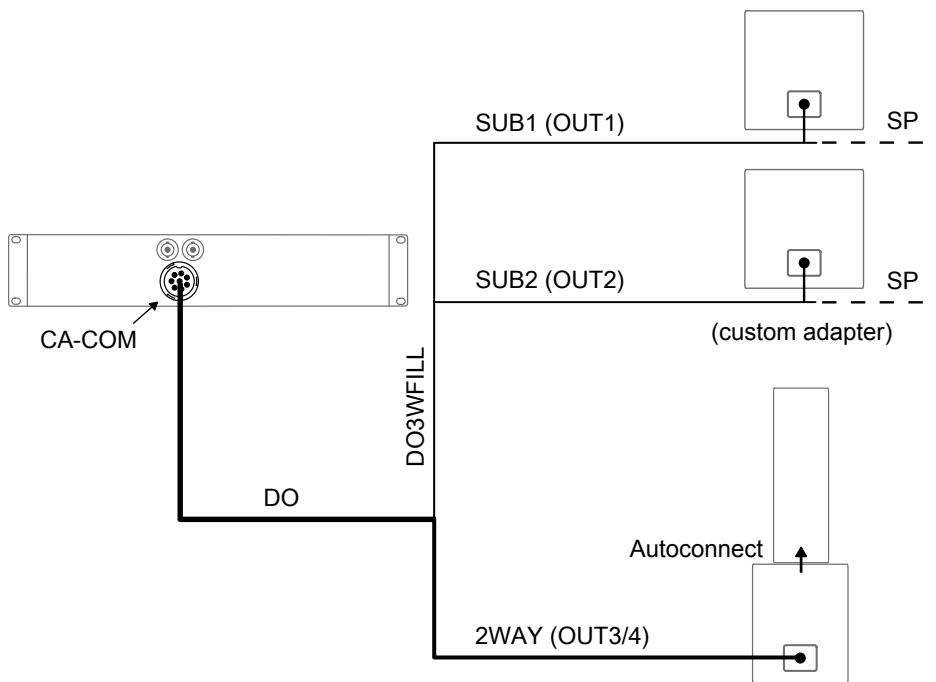


DO and DOFILL-LA8 on CA-COM output



Connecting a hybrid configuration with subwoofers

DO and DO3WFILL on CA-COM output



Preset description

[SYVA]

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 A	0 dB	0 ms	+	ON
OUT 4	PA	IN A	0 dB	0 ms	+	ON

[SYVA LOW_100] [SYVA SUB_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

[SYVA LOW SYVA]

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

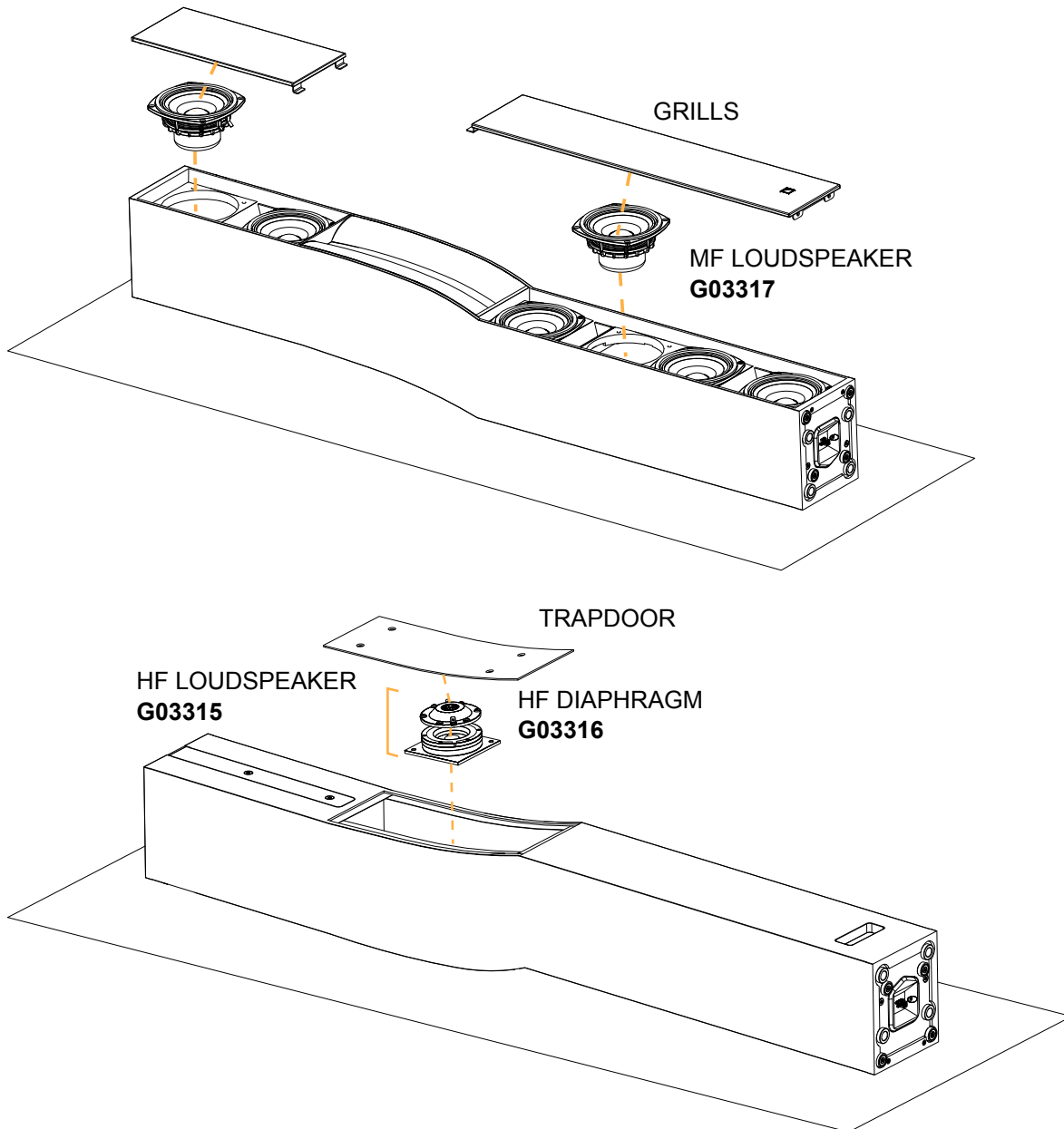
Syva

Disassembly and Reassembly procedures



Place protective material between the enclosure and the floor to avoid scratching the fins.

In order to operate, follow the order outlined here.



D/R - Grills

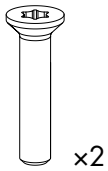
Tools

- torque screwdriver
- T20 Torx bit
- lever

Repair kits

G03317

KR medium loudspeaker 5" Syva



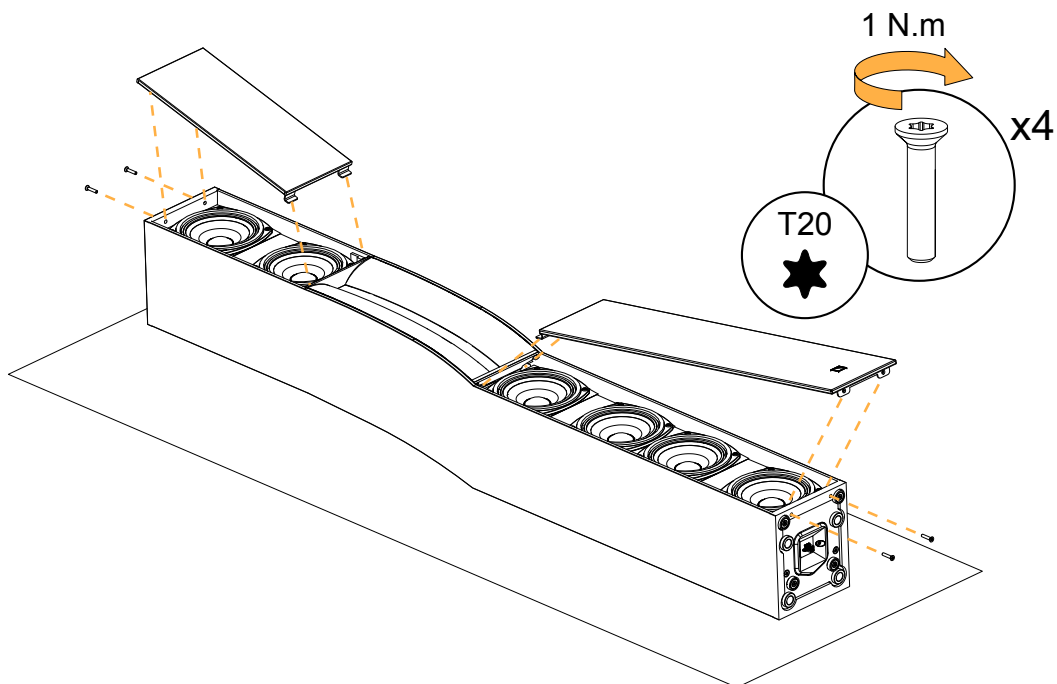
S337

M4x20 Torx

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

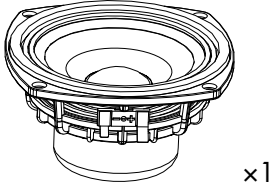
Exploded view

Use a lever to remove the grill.



D/R - MF loudspeaker**Tools**

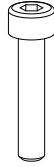
- torque screwdriver
- 3 mm hex bit

Repair kits**G03317****KR medium loudspeaker 5" Syva**

x1

17664

5" MF speaker - 8 ohms



x4

S100145

M4x20 hex

Pre-requisite

Grill disassembled.

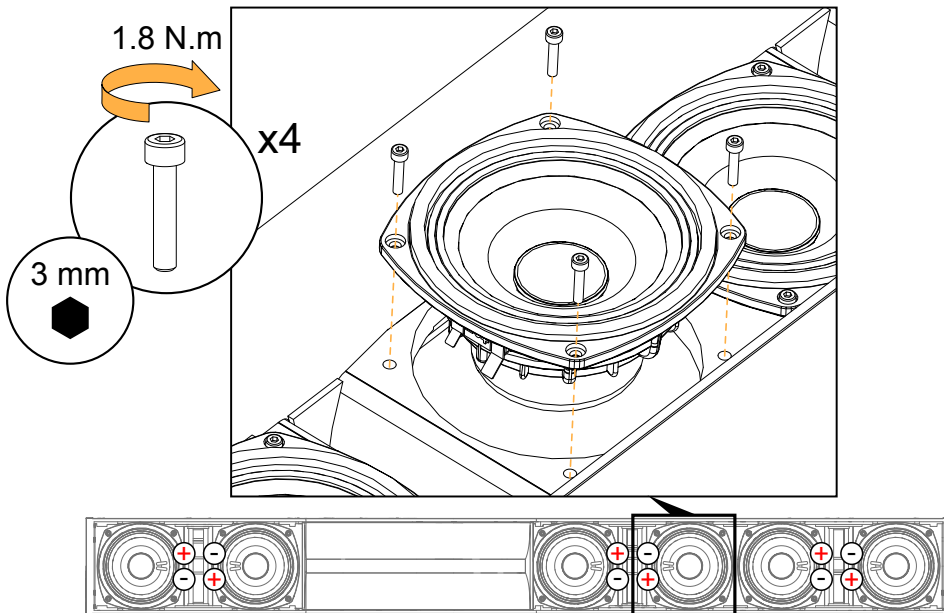
See [Grills](#) (p.25).

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

Exploded view

Gradually tighten the screws following a star pattern.

Place the connectors toward the vents.

**What to do next**

Perform the [Acoustical check](#) (p.36) procedures.

D/R - Trapdoor

Tools

- torque screwdriver
- T25 Torx bit
- lever

Repair kits

G03316 - KR diaphragm 1.75" Syva
or G03315 - KR compression driver 1.75" Syva



S100086

M5x16 Torx

Pre-requisite

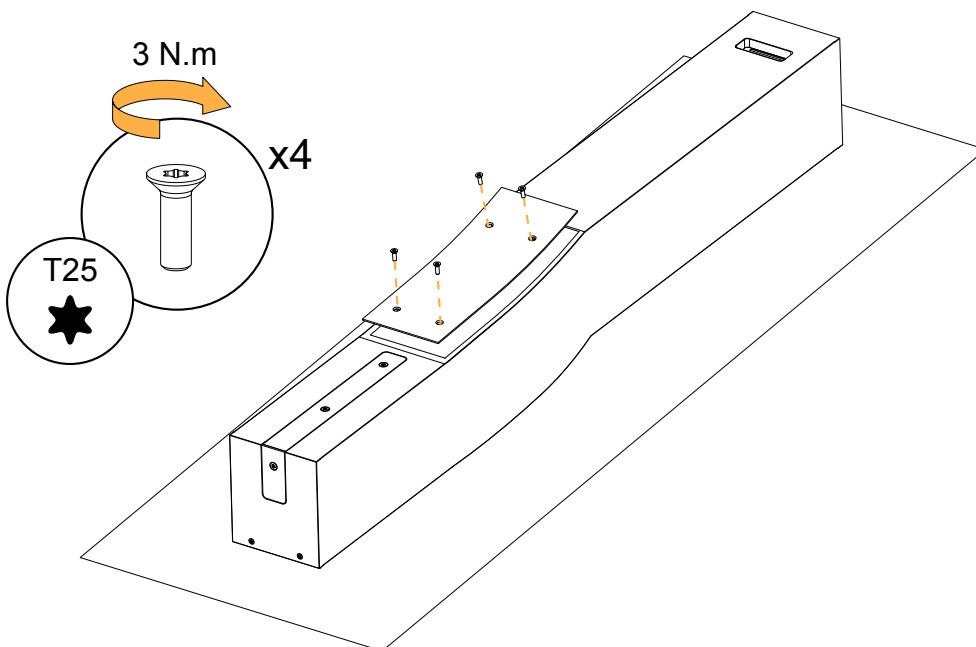
The enclosure is placed on its front face.

! Place protective material between the enclosure and the floor to avoid scratching the fins.

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

Exploded view

Use a lever to remove the trapdoor.



D/R - HF loudspeaker

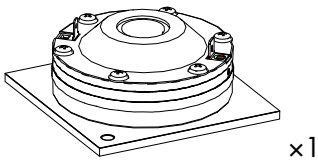
Tools

- torque screwdriver
- 4 mm hex bit - spherical head
- screwdriver extension

Repair kits

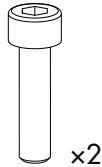
G03315*

KR compression driver 1.75" Syva



G100087

1" HF speaker assembly - 16 ohms



S342

M5x20 hex

* The screws are also available in G03316 - KR diaphragm 1.75" Syva .

Pre-requisite

Trapdoor removed.

See [Trapdoor](#) (p.27).



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

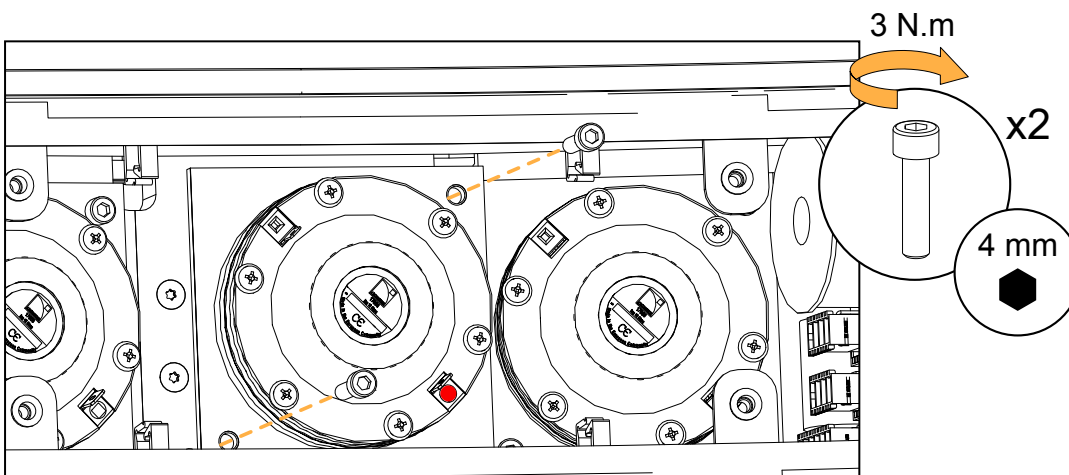
Exploded view



Use a spherical head bit to access the screws of the lateral speakers.

If necessary, unplug the cables to remove the speakers. Refer to [Connecting cables to the filter \(HF area\)](#) (p.40).

Position the positive (red) connector toward the filter.



For each speaker, make sure the driver exit and the waveguide mouth fit together.
The speaker plate must be level with the cabinet.

What to do next

Perform the [Acoustical check](#) (p.36) procedures.

D/R - HF diaphragm

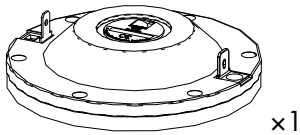
Tools

- torque screwdriver
- T20 Torx bit
- compressed air blower
- double face adhesive tape

Repair kits

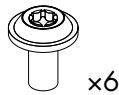
G03316

KR diaphragm 1.75" Syva



17736

diaphragm kit for 1.75" driver - 16 Ω



S17736

M4x8 Torx

Pre-requisite

Trapdoor removed.

See [Trapdoor](#) (p.27).

HF loudspeaker disassembled.

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

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

Exploded view

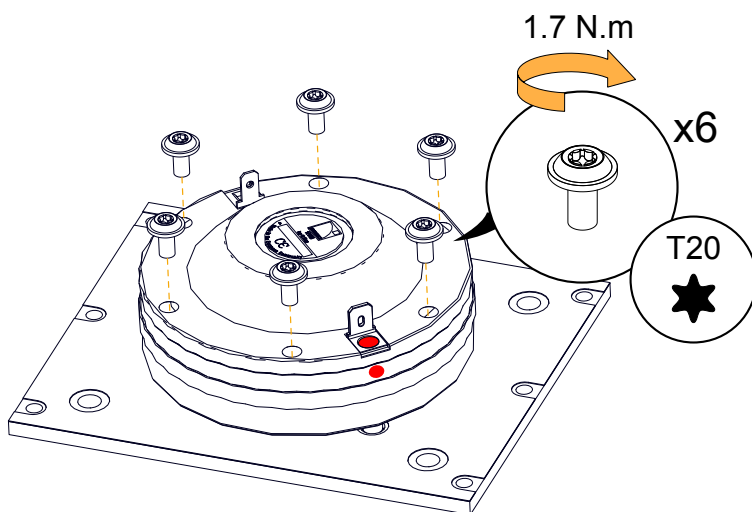


Make sure the air gap is perfectly clean before reassembly.

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

Position the diaphragm assembly with the positive (red) connector aligned with the red mark.

Gradually tighten the screws following a star pattern.



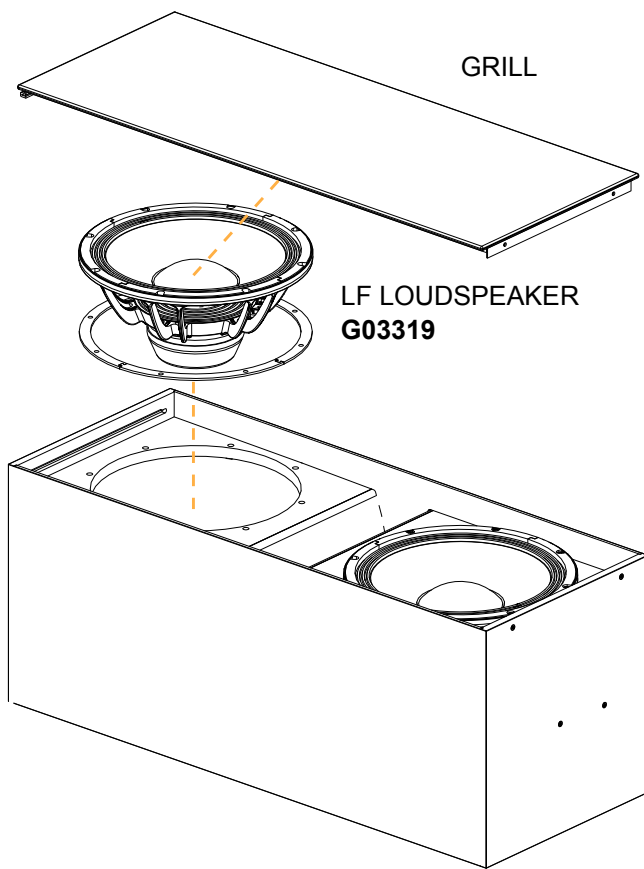
What to do next

Perform the [Acoustical check](#) (p.36) procedures.

Syva Low

Disassembly and Reassembly procedures

In order to operate, follow the order outlined here.



D/R - Grill

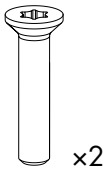
Tools

- torque screwdriver
- T20 Torx bit
- lever

Repair kits

G03319

KR LF loudspeaker 12" Syva Low



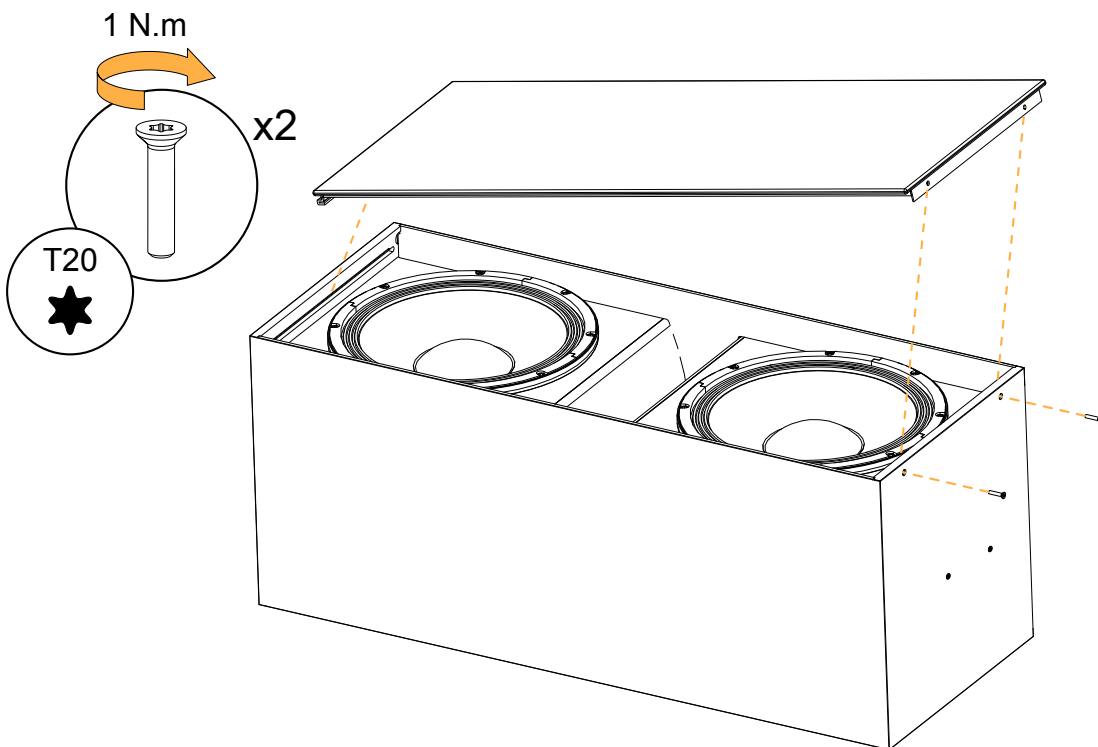
S337

M4x20 Torx

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

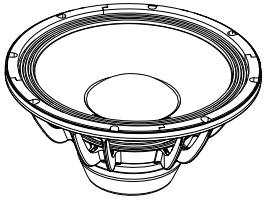
Exploded view

Use a lever to remove the grill.



D/R - LF loudspeaker**Tools**

- torque screwdriver
- 5 mm hex bit

Repair kits**G03319****KR LF loudspeaker 12" Syva Low**

x1

1277

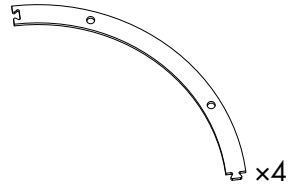
12" LF speaker



x8

S100054

M6x30 hex



x4

1250

12" speaker gasket

Pre-requisite

Grill disassembled.

See [Grill](#) (p.31).

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

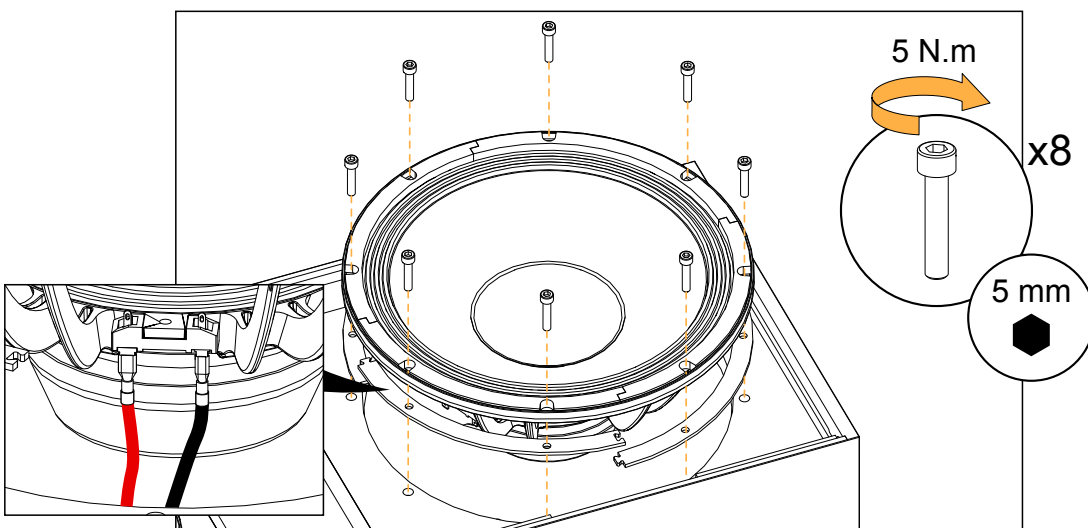
Exploded view

Gradually tighten the screws following a star pattern.



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

Position the connectors toward the vent.

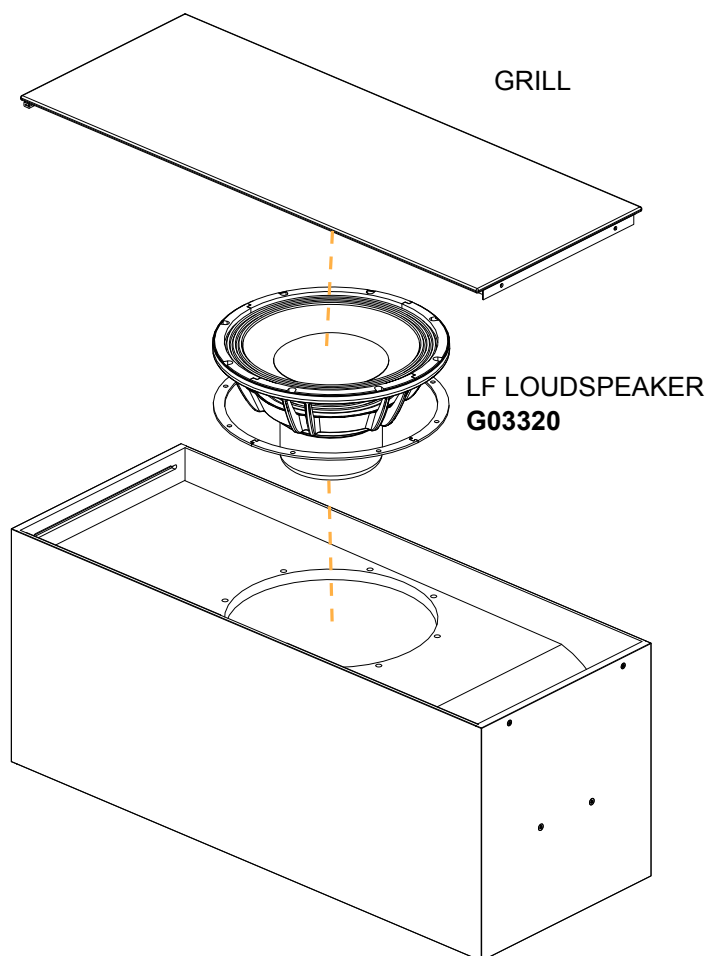
**What to do next**

Perform the [Acoustical check](#) (p.36) procedures.

Syva Sub

Disassembly and Reassembly procedures

In order to operate, follow the order outlined here.



D/R - Grill

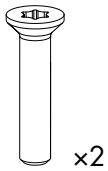
Tools

- torque screwdriver
- T20 Torx bit
- lever

Repair kits

G03320

KR LF loudspeaker 12" Syva Sub



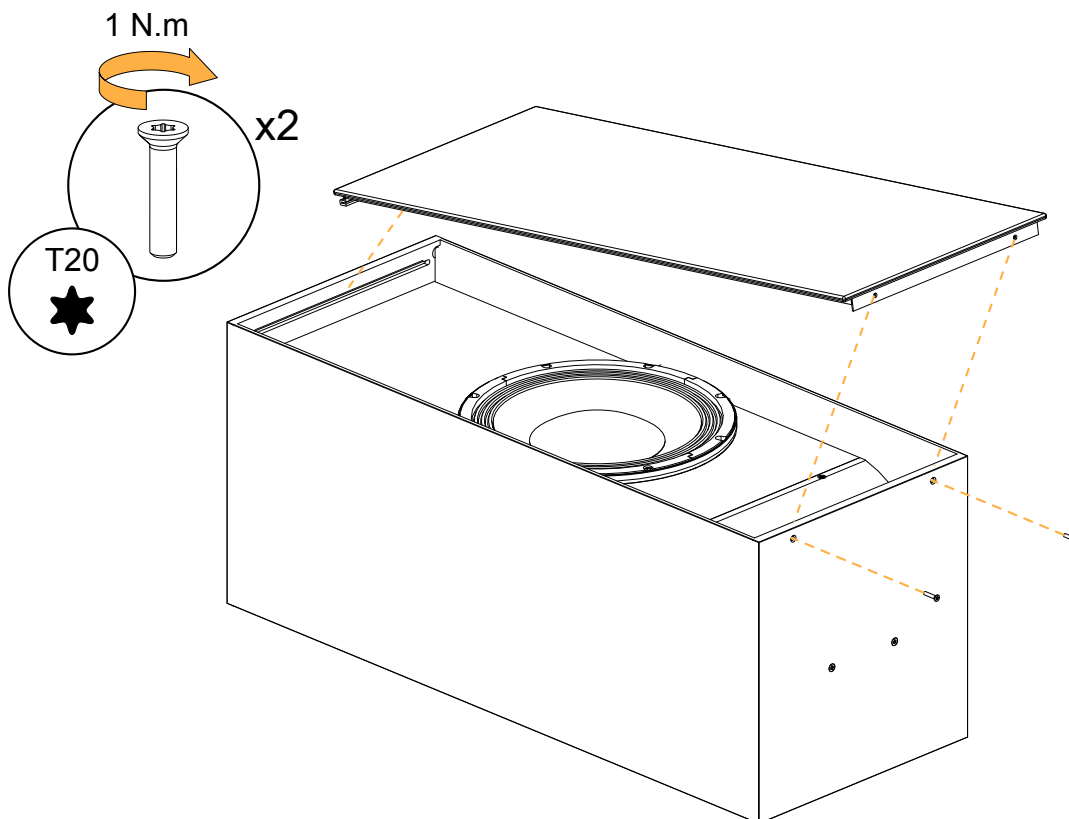
S337

M4x20 Torx

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

Exploded view

Use a lever to remove the grill.



D/R - LF loudspeaker

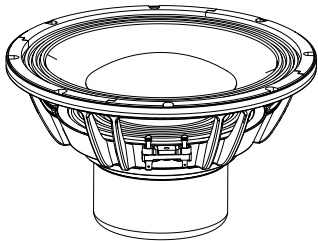
Tools

- torque screwdriver
- 5 mm hex bit

Repair kits

G03320

KR LF loudspeaker 12" Syva Sub



x1

17760

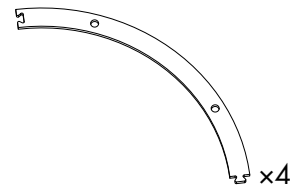
12" LF speaker - 8 ohms



x8

S100054

M6x30 hex



x4

1250

12" speaker gasket

Pre-requisite

Grill disassembled.

See [Grill](#) (p.34).



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

Exploded view

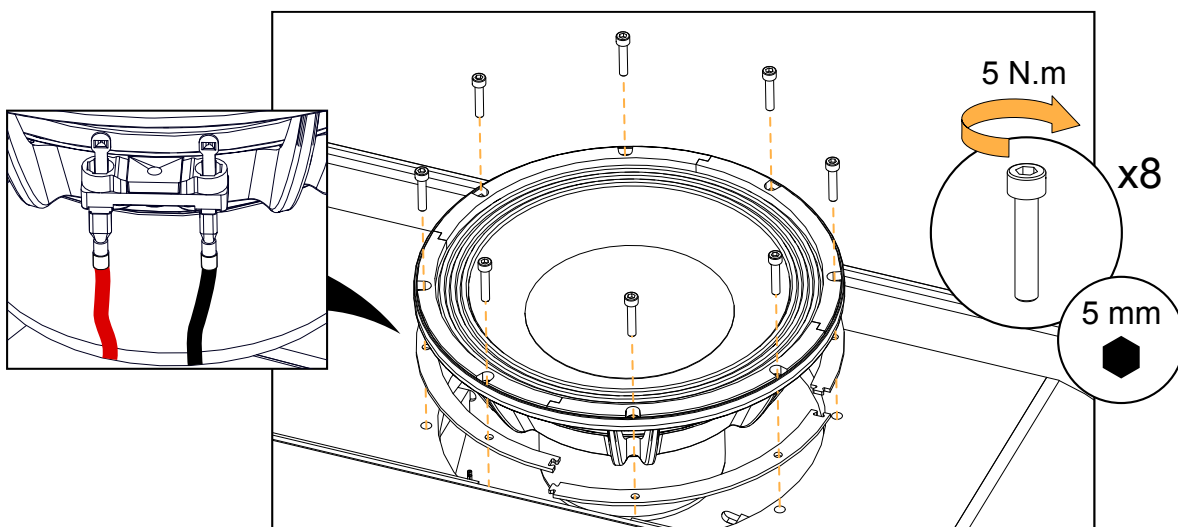


Gradually tighten the screws following a star pattern.



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

Position the connectors toward the top of the enclosure.



What to do next

Perform the [Acoustical check](#) (p.36) 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.

Pre-requisite



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 **Load Sensor Calibration Tool** 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: 1. inspect the cables and connections 2. go to step 8 (p.37)
NOK	measured impedance is not within expected range	1. check that all the prerequisites are met, in particular that the loaded preset corresponds to the connected speaker's family 2. inspect the cables and connections 3. go to step 8 (p.37)
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

Enclosure	Preset	Usable bandwidth
Syva	[SYVA]	87 Hz - 20 kHz
Syva Low	[SYVA LOW_100]	40 Hz - 130 Hz
Syva Sub	[SYVA SUB_100]	27 Hz - 120 Hz

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 speaker and the waveguide are not aligned.

Procedure

1. Remove the trapdoor and check the HF speakers.



For each speaker, make sure the driver exit and the waveguide mouth fit together.

The speaker plate must be level with the cabinet.

2. Perform the HF speaker disassembly procedure.
3. Perform the diaphragm disassembly procedure.
4. Visually inspect the diaphragm and the voice coil.
If any damage is visible, replace the diaphragm.
5. Clean the air gap thoroughly.
6. Perform the reassembly procedure.
Pay close attention to the position of the diaphragm.
Apply the recommended torque.
7. Repeat the listening test.
If the problem persists, replace the loudspeaker.

Troubleshooting for LF/MF speakers

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

Possible causes

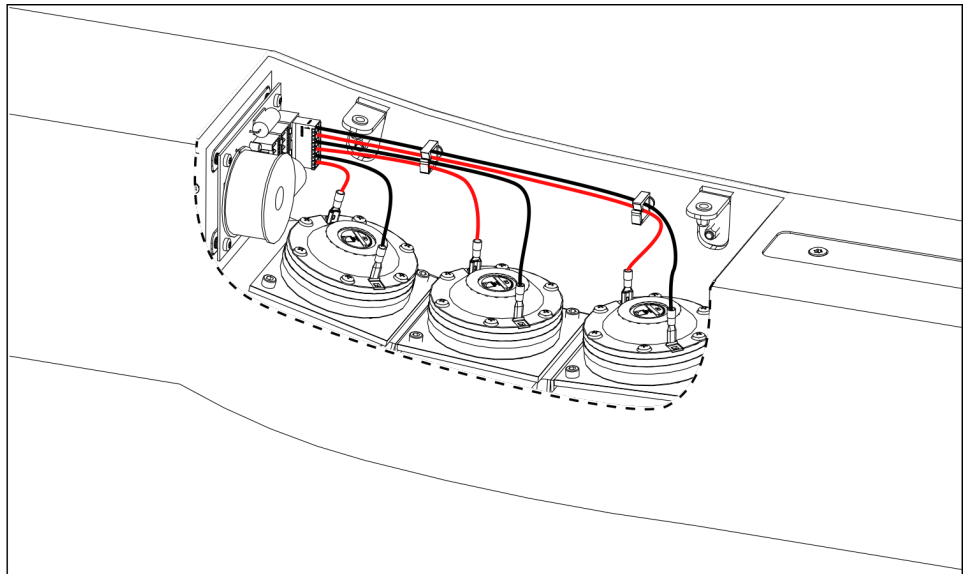
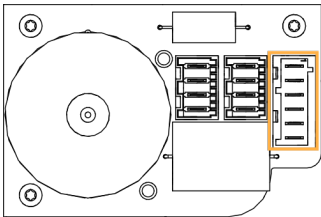
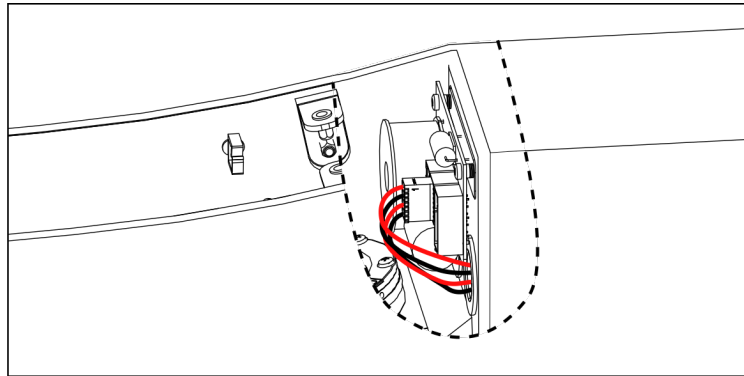
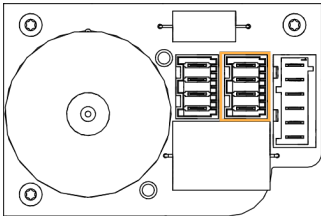
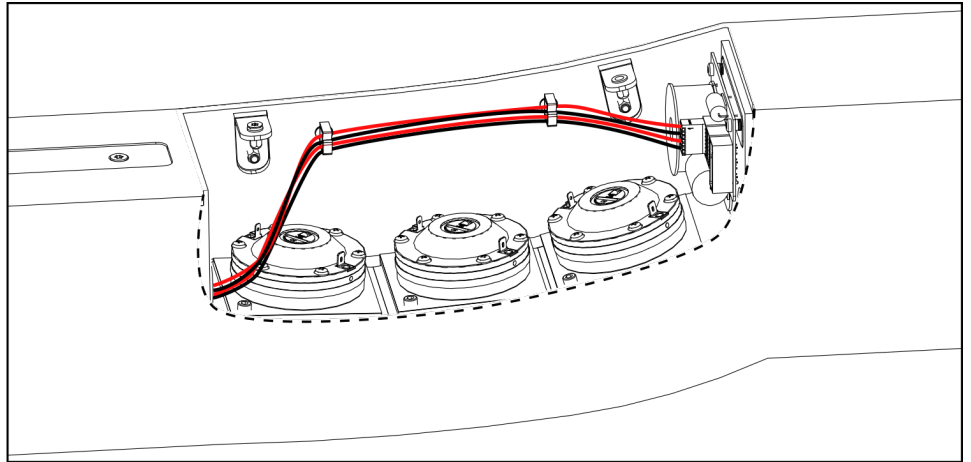
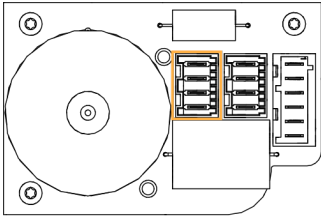
- The screws used for reassembly are too loose.
- There is an air leak in the gasket.
- There is dust on the cone.
- The cone is damaged.
- The voice coil and/or the spider is damaged.

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. Repeat the reassembly procedure.
Replace the loudspeaker gasket and the screws.
Apply the recommended torque.
5. Repeat the listening test.
6. If a buzzing sound is still audible, repeat the test on the loudspeaker outside of the enclosure.
If the problem persists, replace the loudspeaker.

APPENDIX A: Cabling Syva

Connecting cables to the filter (HF area)



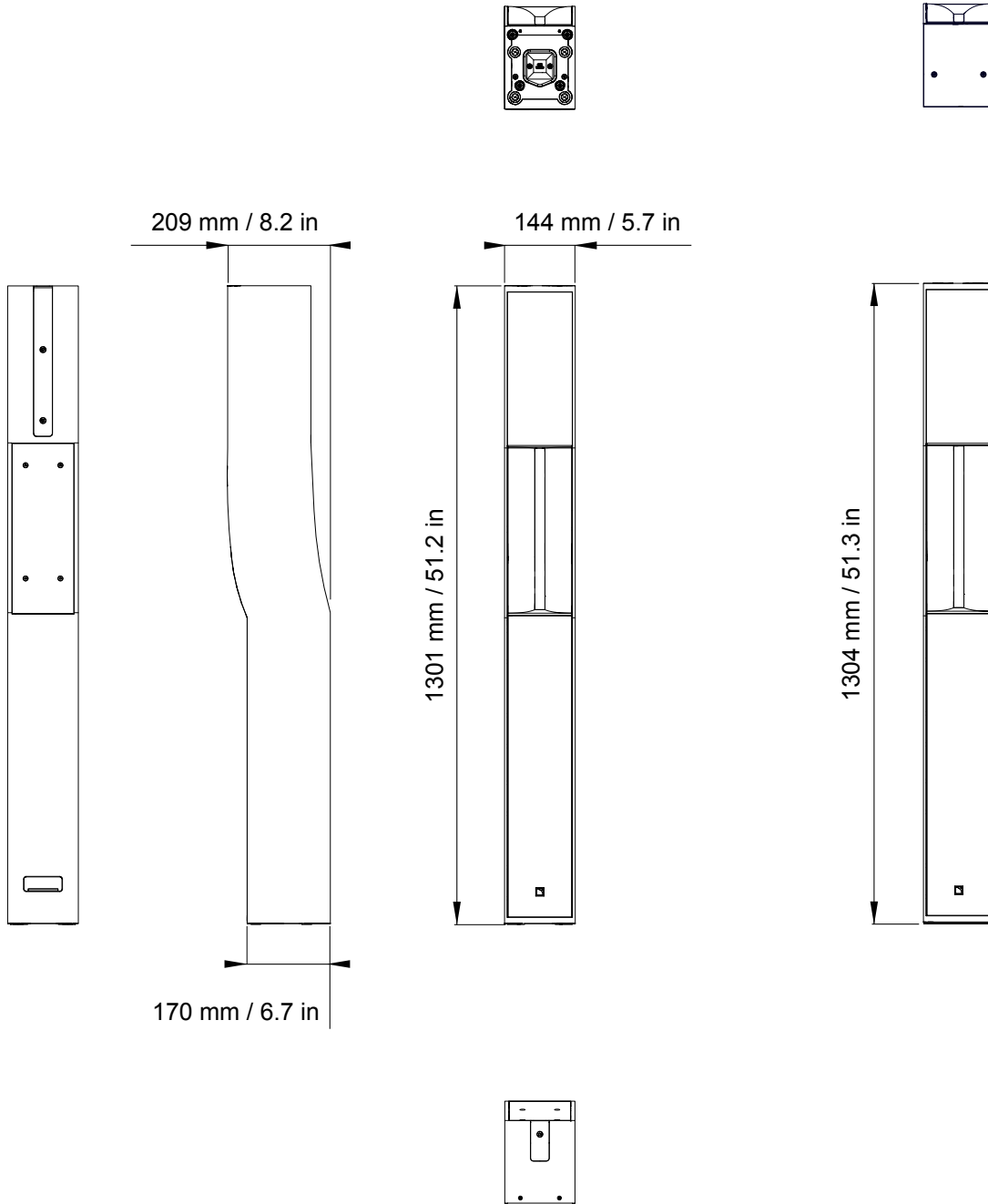
Specifications

Syva specifications

Description	2-way-passive enclosure: 6 x 5" LF + 3 x 1.75" HF diaphragm, amplified by LA4X / LA8 / LA12X
Usable bandwidth (-10 dB)	87 Hz - 20 kHz ([SYVA])
Maximum SPL¹	137 dB ([SYVA])
Nominal directivity	vertical: +5°/-21° in J shape (> 1 kHz) horizontal: 140° (>1 kHz)
Transducers	MF: 6 x 5" HF: 3 x 1.75", compression driver
Acoustical load	MF: bass-reflex, L-Vents HF: DOSC, L-Fins
Nominal impedance	8 Ω
Connectors	IN: 4-point speakON and screw terminal AutoConnect
Rigging and handling	DIN580-compatible M8 threaded insert for secondary safety 2 integrated inserts for rigging accessory
Weight (net)	21 kg / 46 lb
Cabinet	first grade Baltic beech and birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Finish	fine grain dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP54

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

Syva dimensions

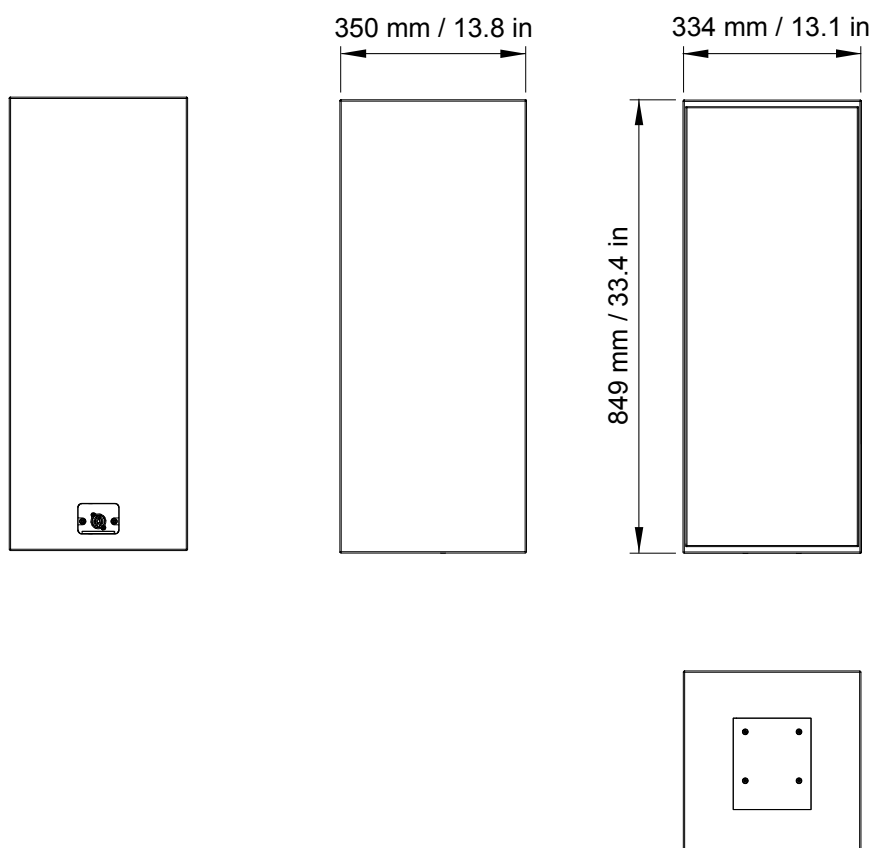


Syva Low specifications

Description	High power low frequency subwoofer: 2 x 12" LF, amplified by LA4X / LA8 / LA12X
Low frequency limit (-10 dB)	40 Hz ([SYVA LOW_100])
Maximum SPL¹	137 dB ([SYVA LOW_100])
Transducers	LF: 2 x 12"
Acoustical load	bass-reflex, L-Vents
Nominal impedance	4 Ω
Connectors	IN: 4-point speakON AutoConnect
Weight (net)	29 kg / 64 lb
Cabinet	first grade Baltic beech and birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Finish	fine grain dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP55

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

Syva Low dimensions

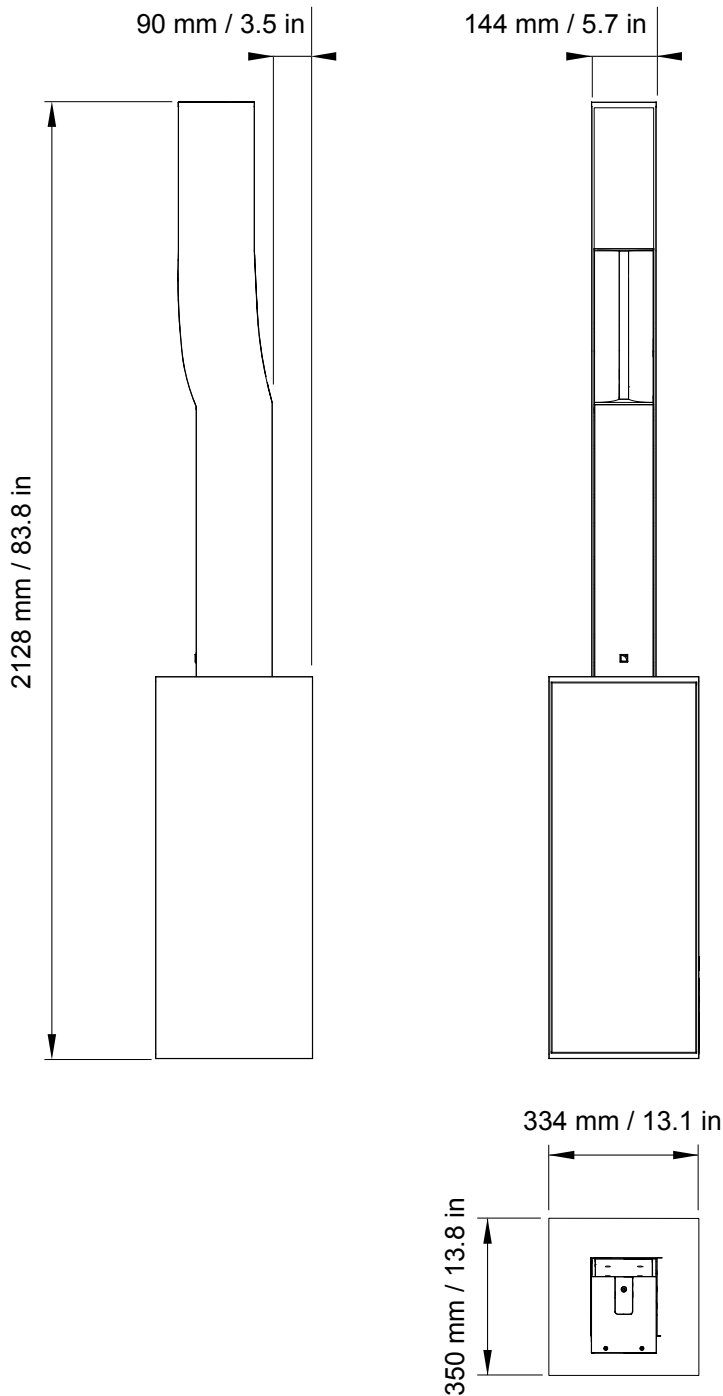


Syva on Syva Low specifications

Description	hybrid configuration, amplified by LA4X / LA8 / LA12X
Usable bandwidth (-10 dB)	40 Hz - 20 kHz ([SYVA LOW SYVA])
Maximum SPL¹	142 dB ([SYVA LOW SYVA])
Connectors	IN: 4-point speakON
Weight (net)	50 kg / 110 lb

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

Syva on Syva Low dimensions

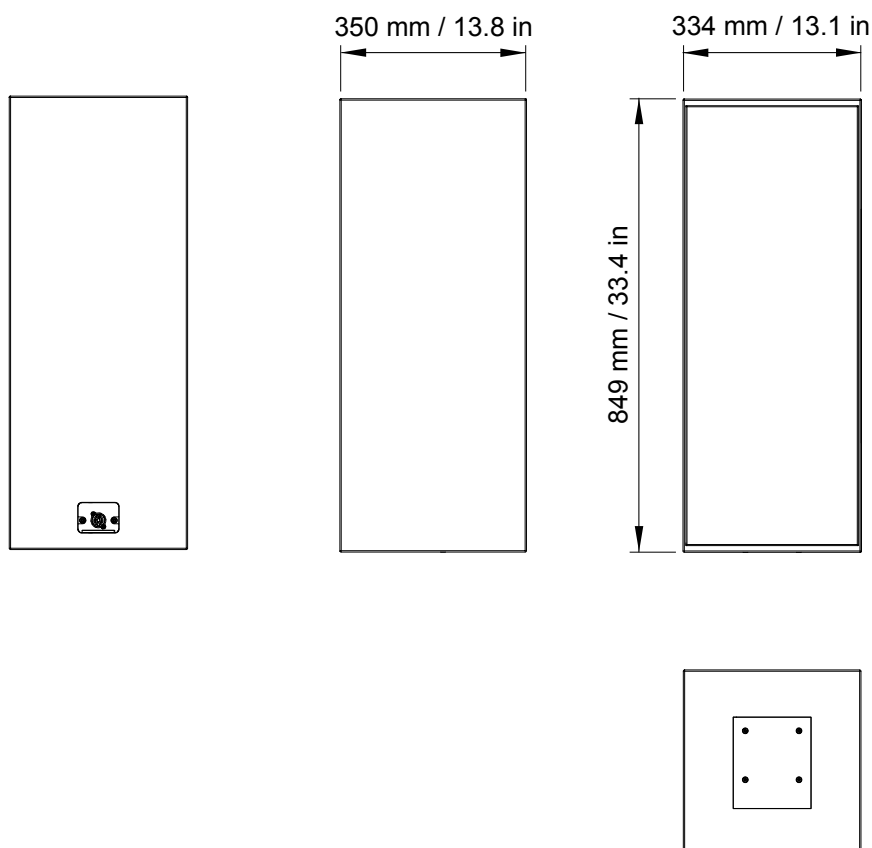


Syva Sub specifications

Description	Infra low frequency subwoofer: 1 x 12" LF, amplified by LA4X / LA8 / LA12X
Low frequency limit (-10 dB)	27 Hz ([SYVA SUB_100])
Maximum SPL¹	128 dB ([SYVA SUB_100])
Transducers	LF: 1 x 12"
Acoustical load	bass-reflex, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 4-point speakON AutoConnect
Weight (net)	27 kg / 60 lb
Cabinet	first grade Baltic beech and birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Finish	fine grain dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP55

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

Syva Sub dimensions





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