K&F SONA SUB II

User's Manual

Translation of the original instructions

Version 1.6
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Important Information, Please Read Before Use!

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KLING & FREITAG
SOUND SYSTEMS

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1. Introduction

Thank you for purchasing a KLING & FREITAG product. To guarantee a trouble-free operating of the equipment and to allow your KLING & FREITAG SONA SUB II system to achieve its full potential read the user's manual carefully before use. This item is a quality accessory for the SONA SUB II speaker system. As the owner of a SONA SUB II loudspeaker, you now have a versatile and highly professional tool which, when operated properly, is a true pleasure to use.

1.1 Icons Used

Warning

This icon indicates a risk of injury or death. Not following these instructions may result in serious health problems including potentially fatal injuries.

Caution

This icon indicates a possibly dangerous situation. Not following these instructions may cause minor injuries or damage.

Notice

This icon marks instructions for proper use of the described products. Not following these instructions may cause malfunctions or damage.

Tip

This icon marks information provided for simplified use of the described products.

1.2 About this Manual

All specifications regarding the features of the described products and applicable safety guidelines provided in this manual are based on information available at the time of publishing.

We assume no responsibility for technical specifications, dimensions, weights, and properties.

All information in this manual is subject to change without notice.

All persons who use the speaker system must have this guide and all further information for safe operations available to them during assembly, disassembly, and use. The speaker system may neither be set up nor used until these user's manual has been read, understood and kept readily available in site.

All KLING & FREITAG manuals are originally authored in German.

KLING & FREITAG spare manuals are separately available for order or can be downloaded from our website: www.kling-freitag.de.

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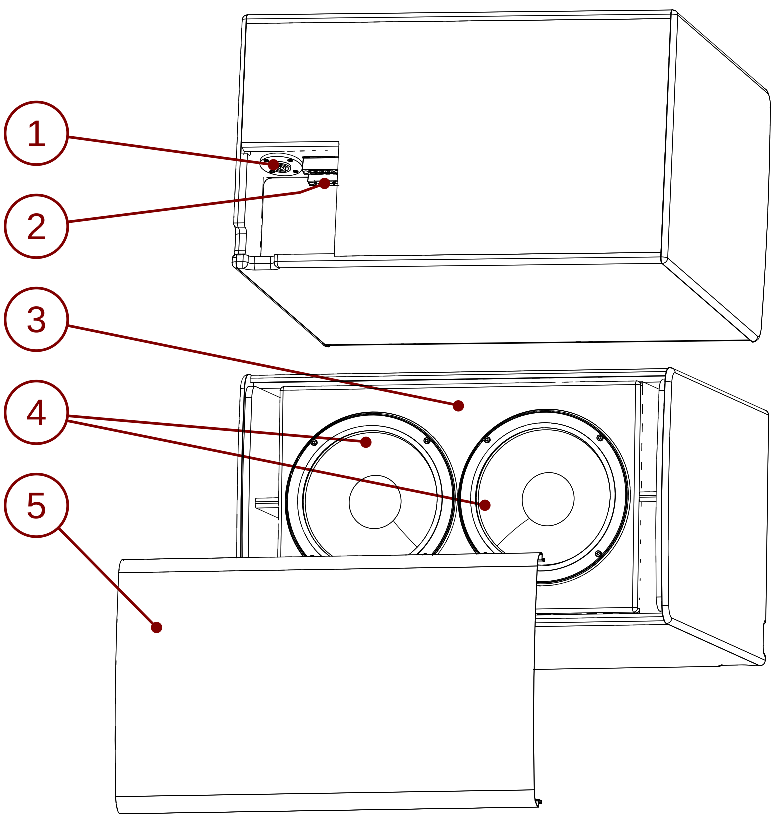
2. Product Description

The subwoofer SONA SUB II is the ideal bass supplement for K&F SONA speakers. With its discreet appearance, it fits in nearly any architecture. The practical mounting points with a double keyhole design enable wall and ceiling installation. In addition to possible use with the K&F Controller CD 44, it can also be operated with a universal electronic crossover. This possibility makes it extremely attractive not only because of its convincing performance but also economically. SONA-Lautsprecherserie

2.1 Items Included

- A subwoofer for use with the top speakers K&F SONA-Lautsprecherserie.
- 2 x 4-way phoenix plug for the corresponding jacks in the speaker
- (1x) User manual

2.2 Components



1. **SpeakOn Connector** type NL4 MPR, parallel wiring to Phoenix connector.
2. **Phoenix Connector** incl. plug connector, parallel wiring to SpeakOn connector.
3. **Speaker Enclosure**
4. **Speaker Chassis**
5. **Front grille**, mountable and demountable without tools.

2.3 Required signal processor

The following information does not apply to the option "XO" :
When using the SONA SUB II, a signal processor is required such as an electronic crossover or the K&F Controller CD 44.

The signal processor must provide at least the following settings:

- 1 x high-pass 4th order
- 1 x low-pass 4th order
- 1 x bell filter

Further information in chapter Configuration and Connecting Diagram on page 12 ff.

3. Safety Instructions

3.1 Mounting the Speakers / Wall and Ceiling Installation

Warning

Suspended loads pose a safety risk.

Only qualified technicians are permitted to perform the installation steps. Be sure to use personal protective equipment at all times.

The technicians installing the speaker on site are responsible for and guarantee safe setup and use.

Never use signal cables or power cords for suspending, aligning, or securing the systems.

Before installing, check the stability, strength, and materials of walls, ceilings, and boarding. For example, use suitable rawlplugs for wall panels and make sure the strength is sufficient.

Note that the suspension points on the hall ceiling (i.e. shackles, attachment points, or chain hoists) must comply with the DGUV regulations 17 and 18 or similar locally applicable accident-control standards. The maximum load must have been certified by an authorized expert.

Be sure to tighten all bolts and screws to the specified torque.

Unless otherwise stated, use only KLING & FREITAG original parts for mounting the speakers. Never use other parts (in particular, parts not made by KLING & FREITAG).

Make sure all fittings used are suitable for the task at hand and meet all relevant safety requirements.

Ensure that all connections are secured against coming loose and that only authorized, statically tested and correctly sized supports, mounting equipment, wire ropes and chains are used.

Be sure to always visually inspect all safety-related speaker and accessory components before use. If there are signs of wear, cracks, or deformation, etc., replace the affected parts immediately. Visual inspection also includes checking all screwed connections of supporting components.

The information described here does not relieve the user of the duty to follow the given safety requirements and legal regulations.

3.2 Notes for Mounting the Speakers

Warning

Mount the speakers securely. To avoid injury or damage, always be sure to mount the speakers securely so that they do not fall.

Please note that speakers can move as a result of vibrations. To prevent them from falling from their mounted position, they must be secured properly.

Run the cables in a way that nobody can trip over them.

3.3 Preventing Hearing Damage

Caution

Keep your distance from operating speakers. This equipment is capable of delivering sound pressure levels in excess of 90 dB SPL, which may cause permanent hearing damage.

3.4 Protecting the Speakers / Operating Safety

Notice

In general, audio signals must not be overdriven. This may be caused by mixing consoles, equalizers, effect equipment, etc. and should be indicated on this equipment. When a power amplifier is overloaded at the output (clipping), then the amplifier should activate a clipping warning signal. Power amplifiers can also be overloaded at the input circuit without the amplifier signalling the clipping, i.e. when there is not sufficient headroom in the input circuit. We, therefore, recommend turning up the power amplifiers all the way and adjusting the level before the power amplifier in order to avoid overloading the input circuit. In any case, the signal must be reduced as soon as it sounds unnaturally distorted.

Operations without CD 44 Controller (only option "XO"):

- To protect the speakers from being destroyed and to avoid fire hazard, they should only be operated with professional power amplifiers with a maximum rated output power of 150W@8Ohm.
- If power amplifiers have power ratings lower than 75W@8Ohm, then it is imperative that the amplifiers have clipping limiters. Alternately, you can also insert a clipping limiter before the amplifier.
- To achieve sensible acoustic results and to protect the speaker from mechanical destruction during use, the speaker must be filtered according to these user's manual. See chapter Configuration and Connecting Diagram from page 12.

Operations with CD 44 Controller:

- For optimal performance and operating safety of the SONA SUB II speakers we recommend using the system controller K&F CD 44.
- When operating the loudspeaker with amplifers without clipping limiter and nominal amplifier power less than 75W@8Ohm requires to set a Limit Reduction of 3 dB for the K&F CD 44 controller.
- The destruction of speakers and the risk of fire as a result of a very rare power amplifier or speaker defect may not be avoided by the controller in any case.

For damage caused by

- overloading the speakers or
- using power amplifiers with other than the recommended maximum output power

we do not assume warranty and excludes liability for possible consequential damage.

The following signals may damage the speakers:

- clipping power amplifiers
- permanent high-level signals with high frequency and continuous noise from feedback,
- permanently distorted high-level signals,
- noises, which occur when the amplifier is on while equipment is being connected, disconnected or switched on.

Do not install devices in any of the following places:

- where the devices are permanently exposed to direct sunlight.
- where the devices are exposed to high moisture or rain.

- where the devices are exposed to strong vibrations and dust.

Avoid damage caused by the speakers' magnetic fields

Speakers are permanently surrounded by a magnetic field, even when they are not connected. Therefore, during transport and placement of the speakers, it is important to ensure that there is a sufficient distance between the speakers and magnetic data media and computer/video monitors (except flat panels).

4. Correct Ratio between Top and Subwoofer

For a balanced sound reproduction, suitable for speech and average music material, one subwoofer SONA SUB II can be combined with up to 4 tops SONA 5. This is valid as long as the amplifiers for subwoofer and top skeakers have the same overall gain and the SONA SUB II is mounted on a wall or on the open floor (reference use).

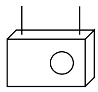
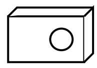
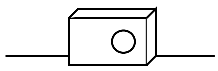
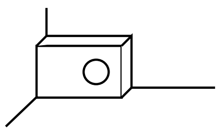
If more bass level is desired for DVD playback or reproducing very low-frequency signals, then the subwoofer can used with 2 SONA 6 speakers or 1 SONA 8 speaker. For this type of use, the subwoofer has to be used with filtering, since there is a risk of mechanical otherwise. For maximum performance and operating safety, select use with the CD 44. For maximum performance and operating safety, select use with the CD 44.

For an additional bass boost the level increase which occurs in room edges and room corners can be used. The placement in room edges and room corners is also beneficial because of the excitation of more room modes which results in a more even bass coverage across the room.

The correct loudness ratio between tops and bass is, therefore, very dependent upon the bass's setup location, the spatial geometry, the required playback material and, last but not least, your personal preferences. For this reason, the ratio between tops and bass should always be assessed on site, for example with a third-octave band analyser or a notebook with corresponding measurement software.

4.1 Level increase because of adjacent areas

As shown in the following table, adjacent areas can lead to significant level differences.

Setup Location	**Name**	**Level increase**	**Pictogram**
Freely suspended	Free field (full space)	+/- 0 dB	
On a surface (Reference use)	Half space	ca. +3 dB to +6 dB	
In a space boundary	Quarter space	ca. +6 dB to +12 dB	
In a corner	Eigth space	ca. +9 dB to +18 dB	

5. Wiring

Warning

Speaker-signal currents are potentially hazardous to the human body.

When the system is in use, make sure that the connectors are secured against inadvertent touch.

When using the Phoenix connector:

To guarantee the protection against contact on the Phoenix connector, you may only use the provided 4-pin Phoenix plug. This is also the case even if you only use two of the Phoenix connector’s pins.

Always fully insert bared wire ends into the Phoenix plug such that bared parts of wire can not be touched.

The bared wire ends have to be accurately screwed into the plugs.

When using the SpeakOn connector:

The Phoenix connector is connected in parallel to the SpeakOn connector.

To guarantee protection against contact on the Phoenix connector, the provided 4-pin Phoenix plug must be plugged in during use. This is also the case even if you just use the SpeakOn connector. Without the Phoenix plug, the Phoenix connector’s contacts have hazardous contact voltage!

5.1 Wiring Instructions

Notice

- Before connecting your SONA SUB II loudspeaker switch off all equipment and turn down all level controls.
- Only use high-quality speaker cables with a sufficient wire gauge. The wire gauge depends on the length of the speaker cable.
- For connections to the power amplifier inputs, please use 2-pin shielded microphone cable (balanced) with high-quality connectors.
- Avoid creating ground loops.
- Be sure to note the pinouts shown in these user's manual.
- Make sure that the +/- polarity of the speakers at the amplifier is correct. When simultaneously using power amplifiers from different manufacturers, be sure to use the correct specific pin configuration. It may be necessary to modify the pin configuration on the power amplifiers or on the connectors leading to them.
- Upon completing wiring, ensure that the connected speaker channels are working in phase, for example, using a voltage tester. When the connected channels are used simultaneously, you can identify out-of-phase statuses by bass cancellation or mid-frequency signals (e.g. voices) that cannot be located properly.
- If several loudspeakers are connected, the signal can be linked through parallel from one loudspeaker to the next. Please make sure that the total impedance of the loudspeakers R(Ohm) is not lower than the minimal impedance indicated on the power amplifier. 1/R1 + 1/R2 + 1/R3 + ... = 1/Rtotal

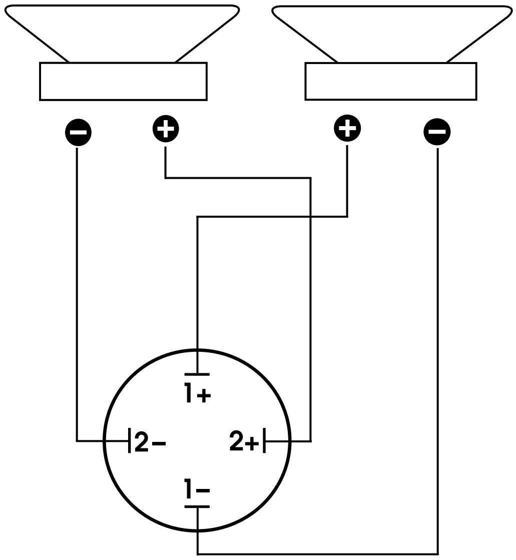
6. First-time Use

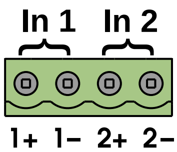
Notice

- Switch off all equipment and turn down all level controls of the mixing console and the power amplifiers.
- Wire your SONA SUB II systems according to the instructions in these user's manual.
- Switch on the mixing console **first**, then the controller and the power amplifier. Always use the before mentioned switching order. Otherwise switching noises may damage the sound system.
- If there is interference, turn off all appliances in the reverse order and check all cable connections.
- Successively turn up the individual power amplifier channels and send a signal with low volume to the system. Check whether the audio is properly routed to the appropriate speakers. Make sure no noise is heard through those speakers.
- Turning down the input level controls may not always prevent distortions in the input section of the power amplifier, especially if this section has a relatively low headroom. A clipping signal may not be displayed by the clipping indicator then! To prevent signal interruptions or damages to the speakers, turn the level controls of the power amplifier to the maximum position, if possible. Set the output level of the mixing console or the controller to a level that doesn't overload the power amplifiers or decrease the limiter threshold of the controller.
- When turning off the system, the input controls for the power amplifiers should be turned down first followed by the power switches of the amplifiers. After that, the other appliances can be turned off.

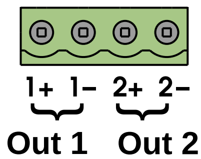
7. Configuration and Connecting Diagram

7.1 Terminal assignment



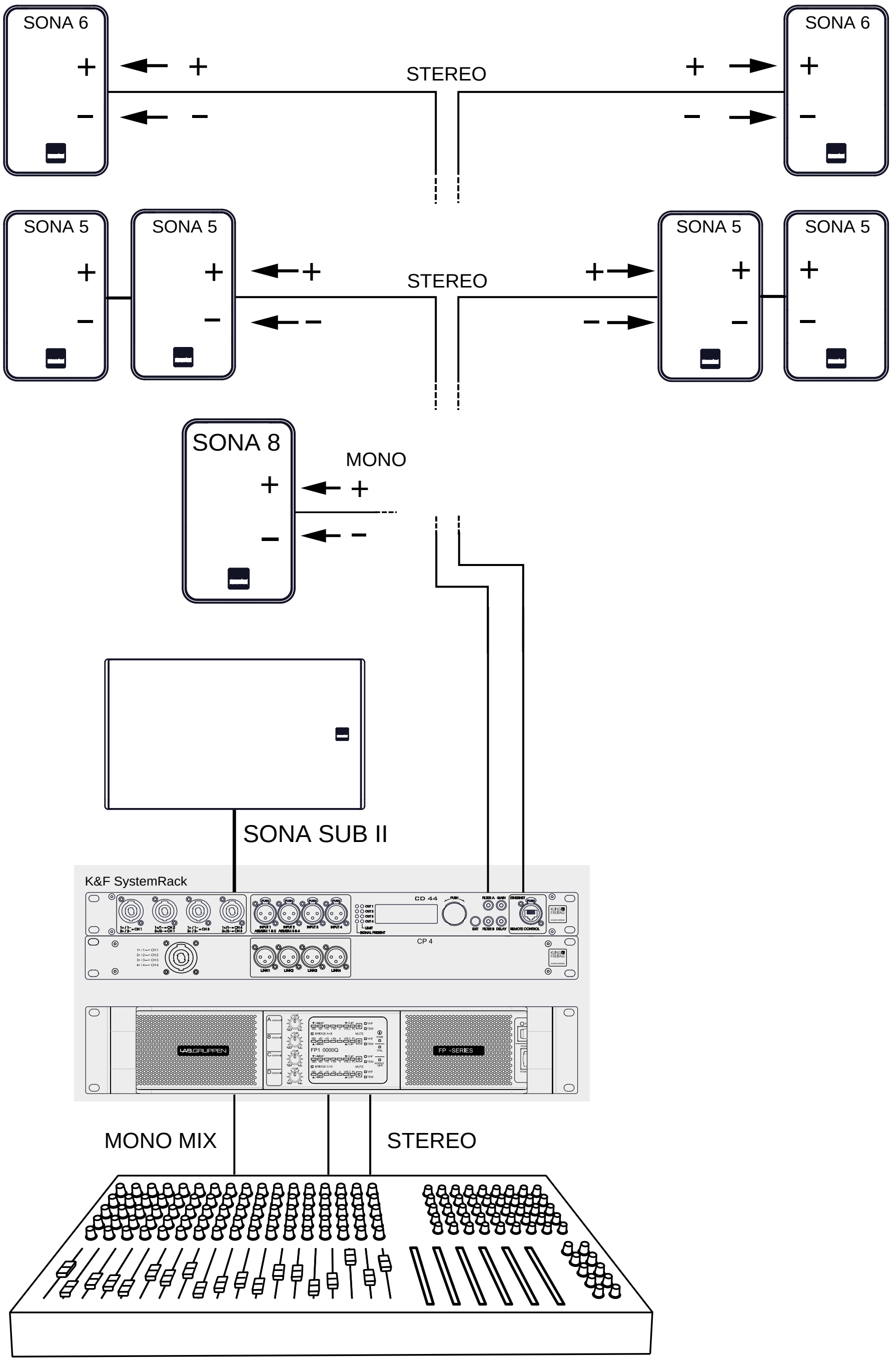


- Without the option "XO" the second phoenix output is parallel to the first phoenix output.
- At the "XO" option the second phoenix output is for top speakers.



7.2 SONA SUB II with SONA top and systemrack

connection diagram



CD 44 Settings

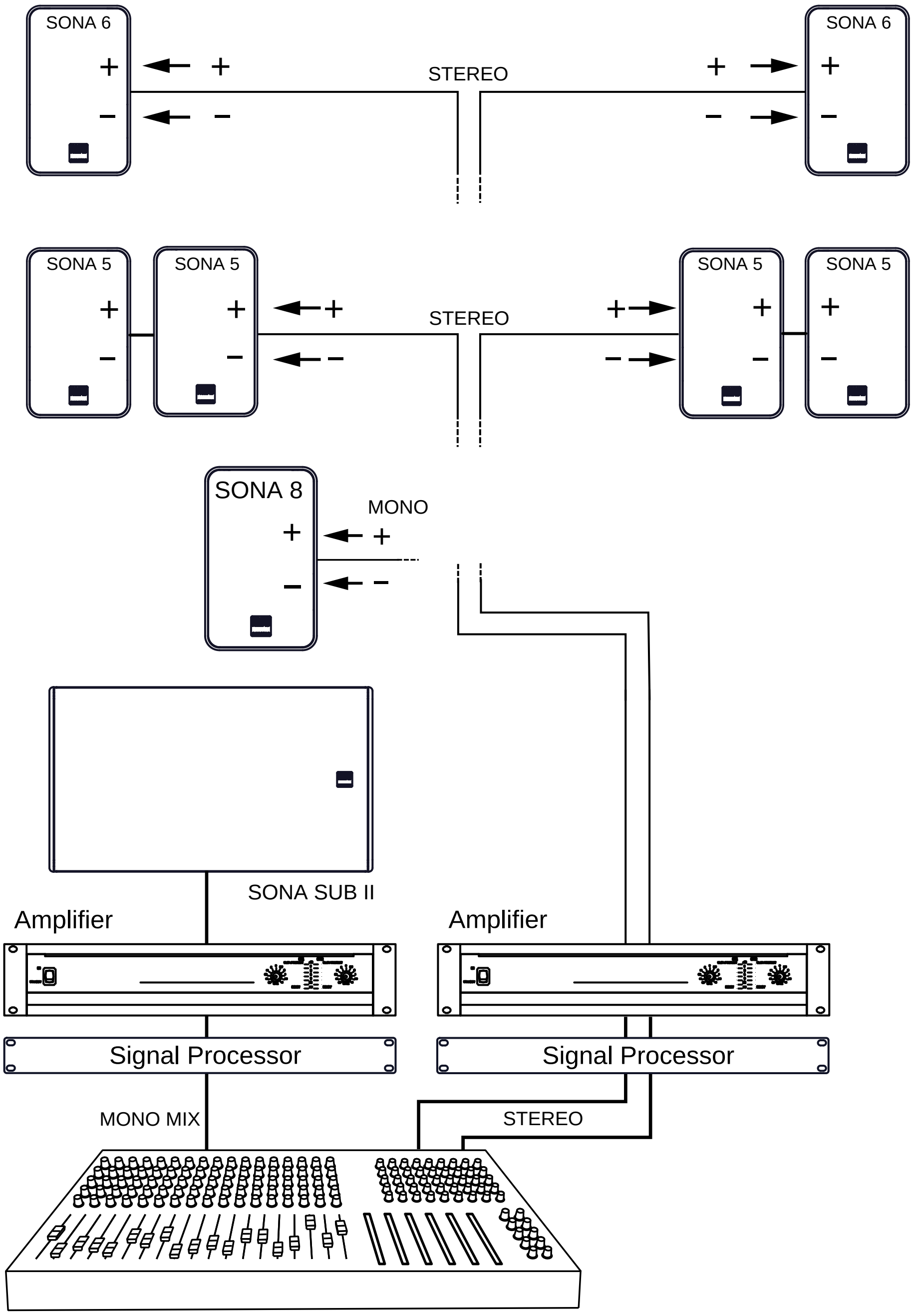
SONA 6:
In the CD 44, choose the LSBlock 'Sona 6 LCut' for the speaker SONA 6.

SONA SUB II:

In the CD 44, choose the LS-Block 'Sona Sub II' for the speaker SONA SUB II.

7.3 SONA SUB II with SONA top, unfiltered

connection diagram



Signal processor settings

SONA SUB II:
High-pass, 32 Hz, 4th order Butterworth

1 x low-pass, 100 Hz, 4rd order Butterworth

SONA 5:
high-pass 60 Hz, 4th ord. Butterworth

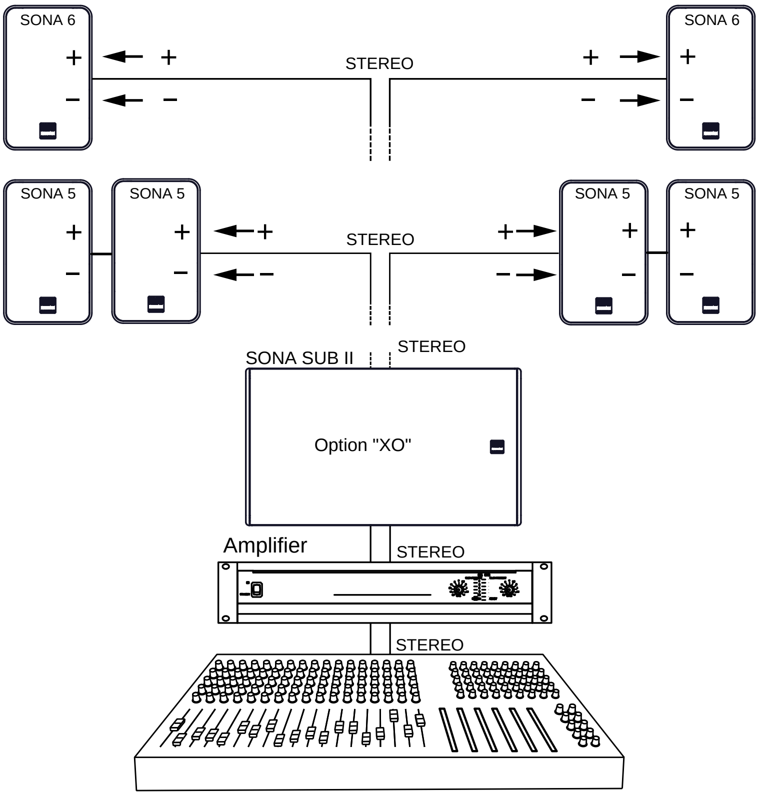
Optional:
Bell Filter, 60 Hz, +4 dB, Q-Faktor 3,5

(bass boost)

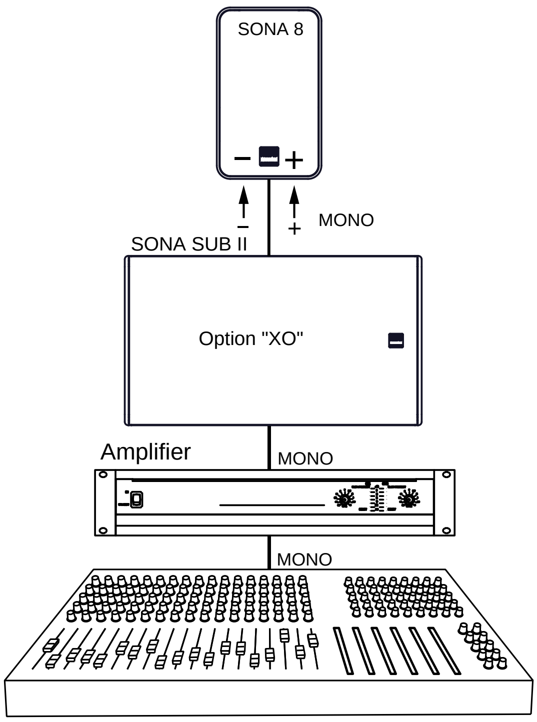
SONA 6 / 8:
hoch pass 130 Hz, 4th ord. Butterwort

7.4 SONA SUB II "XO" with SONA top

connection SONA 5 or SONA 6

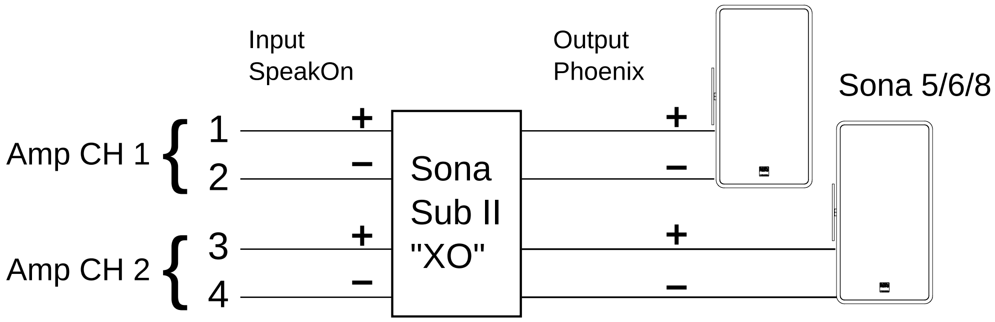


connection SONA 8

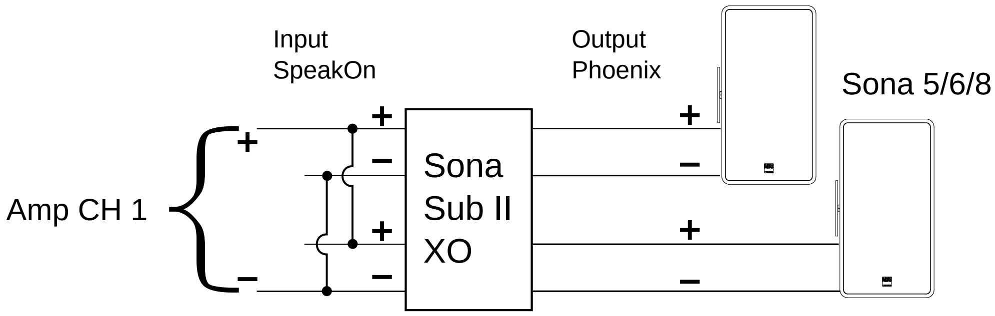


7.5 Wiring example SONA SUB II - 'XO'

Variant 1:
Stereo



Variant 2:
Mono



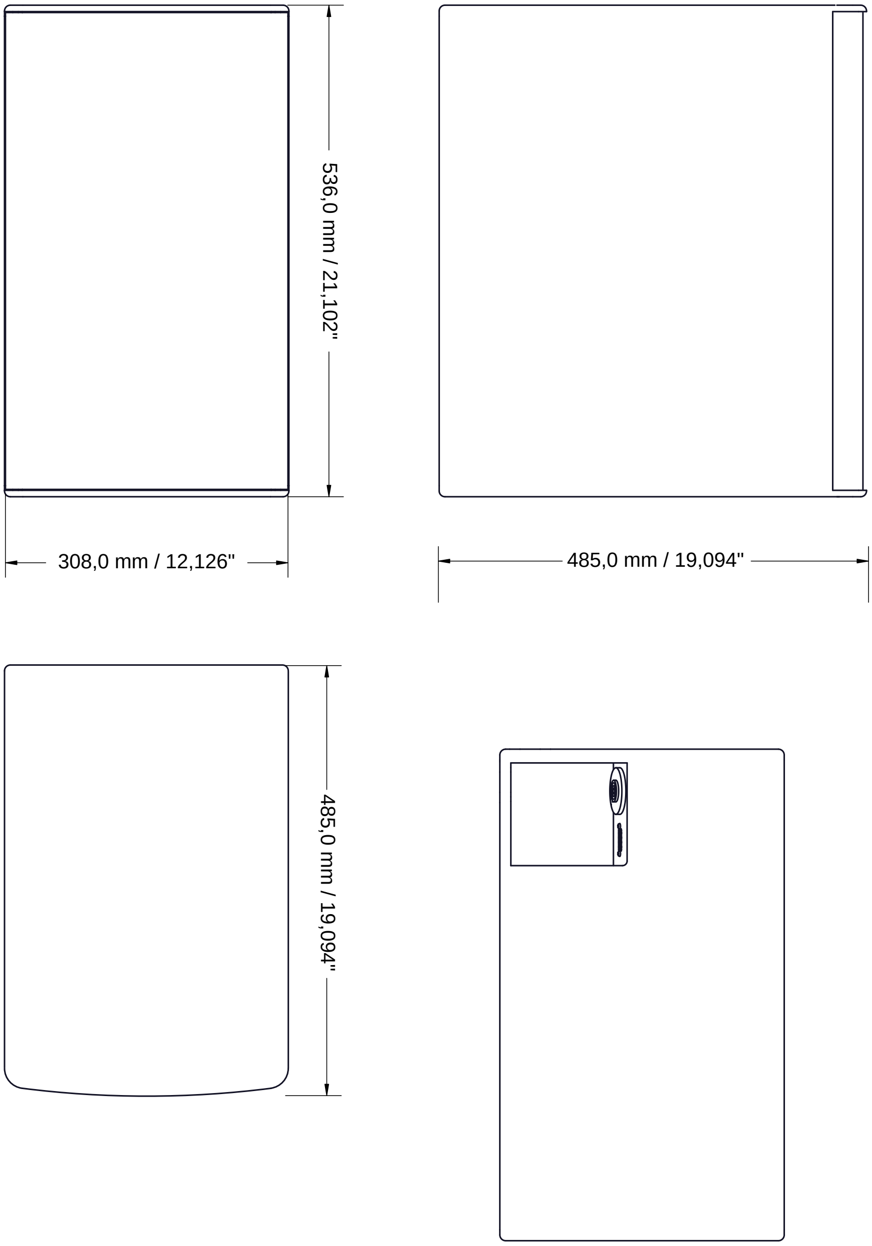
Warning

Please note, that the use of the SpeakOn-Input with a paralell wiring of the chassis in mono mode of the SONA SUB II the amp output can not be used with two channels.

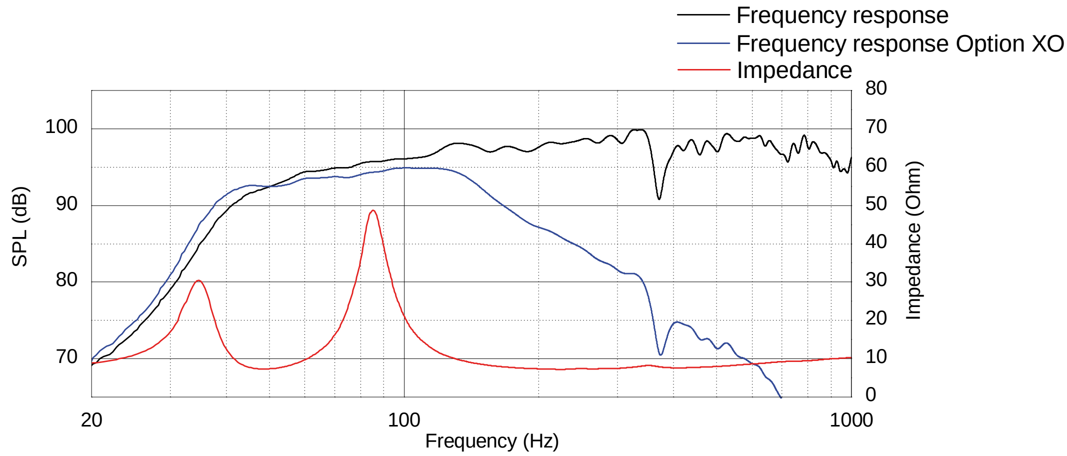
For example: SpeakOn-Out (amp):	Out 1	1+ 1- = CH 1 2+ 2- = CH 2

8. Dimensions

Weight: 16.9 kg



9. Measuring diagram



10. Technical Specifications

Sona Sub II	
Concept	Bass reflex system
Operated with	K&F PLM+ Serie, K&F D-Serie, Lab.Gruppen IPD 2400, K&F SystemRack, K&F TOPAS, passiv at linear Amp with option 'XO'
Frequency range without filter	70 Hz – 400 Hz (±3 dB) 60 Hz – 450 Hz (-10 dB)
Crossover frequency	100 Hz/60 Hz
Lower cut-off frequency	42 Hz (-3 dB)/32 Hz (-10 dB)
Nominal power handling	300 watts
program	600 watts
peak	1200 W
Max. SPL (1 m)	120 dB (SPL Peak/1 m/half space)
Impedance nominal	2 x 8 Ohm (Stereo)/4 Ohm (Mono)
loudspeaker/channel	see matrix
Components	2 x 8“ woofer with 50 mm voice coil
Connection	2 x 4-Pol Phoenix-Anschluss 1 x speakON® 4-pol. NL4MPR (1+/1-)
Enclosure Design	
	12 mm multiplex enclosure, structured mounting, perforated metal grille in the enclosure colour that can be mounted and removed without tools
Dimensions (H x W x D)	536 x 310 x 485 mm
Weight	16,9 kg
Color	RAL 9005 (black) oder RAL 9010 (white)
Optional	'XO' (Crossover with hi- and lowpassfilter), 'special finish in RAL colours'

1) Half space corresponds to wall mounting

2) Pink noise 40 - 250 Hz, 2 h

3) is equivalent to 2) but with 50% duty cycle

11. EC Declaration of Conformity

applicable to all products designated hereafter and distributed by KLING & FREITAG GmbH including model variants unless these products have been altered afterwards.

Loudspeaker systems:

ACCESS B5	E 90 MK II	SEQUENZA 10 N/W
ACCESS B10	LINE 212 -6/-9	SEQUENZA 10 B
ACCESS T5/T9	NOMOS LS CIN	SEQUENZA 5 W
CA 106	NOMOS LS II	SEQUENZA 5 B
CA 205 *) **)	NOMOS LT	SONA 5 **)
CA 1001	NOMOS XLC	SONA 6
CA 1201 *)	NOMOS XLS	SONA 8
CA 1215 -6/-9	NOMOS XLT	SONA SUB **)
CA 1515 -6/-9	PASSIO **)	SONS SUB II
GRAVIS 8 W	PASSIO SUB 12	SW 112
GRAVIS 12 N/W*	PASSIO SUB 15	SW 115D *)
GRAVIS 12+ N/W/XW	SCENA 15	SW 115E
GRAVIS 12+ N/W/XW AS	SEQUENZA 10 N/W	SW 118E
GRAVIS 15 N/W/XW		SW 212E

*) These products are discontinued.

**) These systems are not covered by the Low Voltage Directive because of the rated voltage used.

We declare that the designated product(s) are in conformity with the protection requirements imposed by the following EU directives:

Electromagnetic Compatibility (EMC) Directive	**(2004/108/EC)**
Low Voltage Directive	**(2006/95/EC)**
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	**(VDE 0042-12:2013-02)**

The operating conditions specified in these user's manual must be met accordingly.

This declaration is issued under sole responsibility of the manufacturer:

KLING & FREITAG GmbH
Junkersstr. 14, D-30179 Hannover, Germany

Hannover, 30th March 2015

Jürgen Freitag

(Managing Director / CEO)

12. Disposal

Please recycle the packaging material of the device.

12.1 Germany

Don’t dispose of waste electrical equipment through household waste.

Don’t deliver it to official recycling points either.

All KLING & FREITAG products are plain business-to-business (B2B) products. Therefore, KLING & FREITAG GmbH is exclusively responsible for disposing of all KLING & FREITAG waste equipment marked with a garbage-can icon. Please call the below phone number when you have a KLING & FREITAG product (marked with the garbage-can icon) for disposal. We will offer you a straightforward and professional disposal at no cost.

KLING & FREITAG equipment with no such icon was sold before 24 March 2006; in that case, the owner is legally responsible for disposal. We will, however, gladly assist you by naming appropriate ways of disposal.

For further disposal information of KLING & FREITAG waste products, call +49 (0)511-96 99 7-0

Background information: The Electrical and Electronic Equipment and Appliances Act (ElektroG) is the German implementation of the European (EU) Waste Electrical and Electronic Equipment Directive (WEEE, 2002/96/EC).

Therefore, starting on 24 March 2006, KLING & FREITAG GmbH has marked all products subject to the WEEE that are distributed in Germany with an icon showing a crossed-out garbage can with a white bar below it. The icon indicates that the equipment was distributed on or after 24 March 2006 and must not be disposed of through household waste.

KLING & FREITAG GmbH is legally registered as a manufacturer with the German waste-equipment registration authority (EAR). The WEEE registration number is: DE64110372.

We substantiated towards the EAR that our products are for B2B trade only.

12.2 EU, Norway, Iceland, and Liechtenstein

Don’t dispose of waste electrical equipment through household waste.

Starting on 13 August 2005, KLING & FREITAG GMBH has marked all products subject to the WEEE directive that are distributed in any member state of the European Union (except Germany), Norway, Iceland, or Liechtenstein with an icon showing a crossed-out garbage can with a white bar below it.

The icon indicates that the equipment was distributed on or after 13 August 2005 and must not be disposed of through household waste.

Unfortunately, the European WEEE directive was implemented in different national legislation in the EU member states, making it impossible to offer a consistent disposal solution throughout Europe.

The local distributor (sales partner) in the respective country is responsible for complying with the applicable legislation.

Contact your retailer or the local authorities for information on the regulations applicable in any EU member state (except Germany).

12.3 All Other Countries

Contact your retailer or the local authorities for information on the regulations applicable in any country not listed above.

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