AUDIOTECHNIK

L-Line

USER MANUAL

RIGGING AND ACCESSORIES

Version 2023-07

PRELIMINARY

Thank you for choosing SE AUDIOTECHNIK!

We are happy to be the solution for your sound reinforcement needs with our professional loudspeaker systems. The system you have purchased is based on more than 20 years of experience as a speaker manufacturer and more than 40 years as a speaker developer. SE AUDIOTECHNIK products are compact, easy to use, modular and reliable.

Please, take the time to carefully read this manual and follow its instructions. It will allow you to get the most out of your product under safe operating conditions and suggest some care instructions leading to long-term endurance. Keep this manual in a safe place for further reference!

If you find any mistakes or have further questions or suggestions, please contact us at info@se-audiotechnik.de.

For more information about SE AUDIOTECHNIK products, visit our website https://se-audiotechnik.de. There you will also find the latest updates to manuals, firmware, software and technical documents for additional support.

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SAFETY AND PRECAUTIONS

The products described in this manual have been engineered and manufactured to ensure your personal safety. However, IMPROPER USE CAN RESULT IN SERIOUS INJURIES TO THE USER AND THIRD PARTIES AND OTHER POTENTIAL HEALTH RISKS. Always follow the basic precautions listed here to avoid the possibility of serious injury or even death from mechanical parts, mechanical malfunction, falling parts, damages or interaction with devices used in combination and may lead to electrical shock, short-circuiting, fire or other hazards. These precautions include, but are not limited to, the following items in this manual.

THE USE OF LOUDSPEAKER ACCESSORIES AS WELL AS THE ASSEMBLY AND INSTALLATION OF LOUDSPEAKER RIGS AND STACKS AND THE SUSPENSION OF LOUDSPEAKER ARRAYS MAY ONLY BE PERFORMED BY AUTHORIZED, TRAINED AND CERTIFIED PERSONELL.

ALWAYS FOLLOW RULES AND REGULATION FOR RIGGING, HOISTING AND WORK WITH STACKED OR SUSPENDED EQUIPMENT SET BY THE AUTHORITIES, PROFESSIONAL ASSOCIATIONS AND EFFECTIVE STANDARDS.

IMPORTANT SAFETY INSTRUCTIONS

1. Keep this user manual in a safe place.
2. Read and follow thoroughly all instructions.
3. Heed all warnings.
4. Adhere to and respect any local regulation regarding manipulation, suspension and hoisting of heavy loads.
5. Only use safety pins, attachments, accessories and adapters specified and/or provided by SE AUDIOTECHNIK. Furthermore, adhere to the rigging and use instructions provided in this manual.
6. Arrange an appropriate working environment, clear and free from unnecessary or dangerous objects.
7. Ensure that the ground, surfaces and holding structures are safe, stable and can hold the weight of the designed array.
8. Inspect the conditions of all the equipment, accessories and tools. Make sure no part has any defects, faults or damage that may endanger or compromise safety.
9. Make sure that all personnel handling the product, parts of the product and accessories have received appropriate training and certification.
10. Make sure procedures described in this manual are always performed by personnel under suitable physical conditions, and knowledgeable in safety rigging procedures and the SE AUDIOTECHNIK products and systems.
11. Use appropriate personal protective equipment (safety shoes, helmet, gloves and fall protection) and follow the applicable regulation for working in heights and above head.
12. When installing products above head height, always use proper equipment (ladder, industrial lift, lifting platform) to work safely in the intended height.

13. Keep in mind and respect the maximum load supported by the elements stated in this manual and the maximum load capacity of the structures to which the array is attached.

14. Be aware of risky environmental conditions. When installed outdoors, wind force may generate higher forces and stresses in the components. In those cases, it is highly recommended to lower down and secure the assembly. Keep away from all electrically conductive parts during a thunderstorm.

15. When deploying flown arrays:

    - Remain attentive to any risk of bruising and/or crushing
    - Verify that every component is correctly fastened and secured
    - Always double secure flown elements.
    - Avoid unattached elements on the array
    - Do not stand below hanging loads
    - Never climb on the loudspeaker array
    - Add only as many units to an array at one time as recommended in this manual or as required by applicable workplace safety regulations and other valid requirements.
    - Set up a safety area within the arrays' area of influence for all persons present during set-up, tear-down and during the event.

16. Before transportation, remove all the rigging elements and accessories from the loudspeakers.

17. Clean only with a dry cloth. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths.

18. Do not insert your fingers, hands or any other foreign objects into any holes, gaps or openings of the device.

19. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product at the time of

disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and environment.

GRPAHICAL SYMBOLS ON THE PRODUCT

The exclamation point triangle is used to alert the user to important operating or maintenance procedures and instructions.

The CE mark indicates the conformity with the relevant EU directives for safety, health and environmental protection. See the Manufacturer's Declaration section.

The CCC mark indicates the conformity with the relevant Chinese directives for safety, health and environmental protection.

The RCM mark indicates the conformity with the relevant Australian and New Zealand requirements for electrical safety, EMC, EME and telecommunications compliance.

Symbol indicating that the equipment is for indoor use only.

Symbol for conformity with Directive 2002/96/EC and Directive 2003/108/EC of the European Parliament, on waste electrical and electronic equipment (WEEE).

GRAPHICAL SYMBOLS IN THIS MANUAL

Symbol to alert the user about important operating or maintenance instructions.

Symbol for important concepts and information for a better understanding of the functioning of the product.

Symbol for practical tips and ideas useful to ensure the correct use of the product and improve its operation.

In addition, the terms L 65, L 65 FS, L 35 and L 35 FS refers to both indoor and outdoor versions of each loudspeaker. Any specific reference to one of these versions will be indicated.

Package Contents

The packaging of each L-Line accessory includes:

- 1 unit
- 1 L-Line Rigging and Accessories user manual
- 1 QC PASS card
- 1 Warranty card

Please inspect your product packaging before unboxing it. If it has been damaged during shipping, unbox the product and check for any visual damage before using it. Notify the shipping company immediately and contact your SE AUDIOTECHNIK dealer or support center for help and assistance.

Finally, save the shipping carton as evidence for the possible claim, which only you can request. We also recommend you to keep all the packing materials and contents for any further transportation.

Introduction

This manual covers the accessories and safe rigging procedures for the L-Line line-array system.

Please read thoroughly all the instructions, warnings and procedures detailed in this document. For further documentation, application guides and manuals visit our website at https://se-audiotechnik.de. Referring to and considering all available information may guarantee a safe and optimal performance of the system.

The L-Line system consists of the following:

- L 65: 3-way passive line array cabinet.*
- L 65 FS: Passive flyable subwoofer.*
- L 35: Compact passive 2-way line array cabinet.*
- L 35 FS: Compact passive flyable subwoofer.*
- L-Line rigging elements and accessories: Usage and parts are described in this manual.
- LA 10.4D: Dedicated L-Line System Amplifier.**
- SE Mission Control: L-Line network remote control software.***

* Detailed information are available in the L-Line Loudspeaker manual.

** Detailed information are available in the L-Line system amplifier manual.

***Detailed information are available in in the “SE Mission Control” user manual.

Figure 1. L-Line System.

L-Line Line Array System

The L-Line Line Array System is designed to provide flexibility in combining line array elements to build a system that meets venue requirements and conditions. All L-Line speaker models are equipped with an integrated rigging system. L 65 products features a four-point rigging system whereas L 35 products benefit from a lightweight three-point rigging system.

The bumper frame L 65 BF allows for flying L 65 and L 65 FS cabinets. The bumper frame L 35 BF allows for flying L 35 and L 35 FS cabinets. In addition, L 65 and L 65 FS can also be ground-stacked using L 65 BF bumper frame.

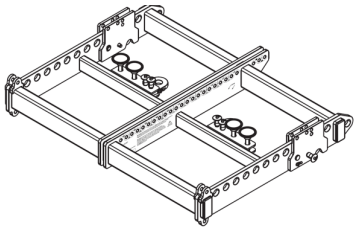
The under frame adapter L 65 UFB offers the opportunity to add L 35 cabinets to any L 65 element. With this option, it is possible to extend the main line array with additional downfills to increase vertical coverage.

With the L 35 UB bracket, you can use L 35 cabinets with a pole mount. The optional SPS 20 M20 pole support allows attaching a L 35 stack to any subwoofer with a M20 thread. L 35 stacks can be great as side-fills or as a small main PA system. There are additional frames available to stack L 35 cabinets directly onto B-Line B 15/A or B 18/A. More information and instructions are covered in the B-Line manuals.

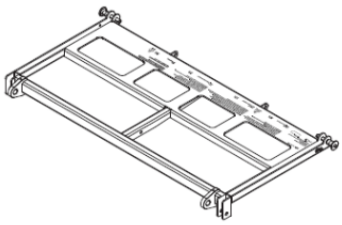
The SE AUDIOTECHNIK rigging system and related accessories provide mechanical safety and functionality to stack and suspend line arrays. Adjustable splay angles and various mounting options offer high precision when defining the curvature of the line array.

L-Line Accessories Overview

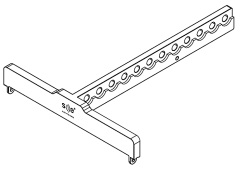
The L-Line includes the following accessories to deploy and combine its loudspeakers under several different configurations:



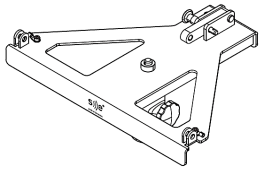
L 65 BF



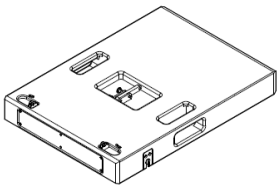
L 65 UFB



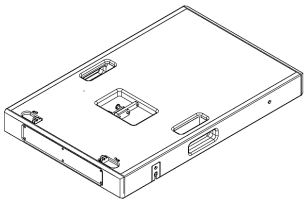
L 35 BF



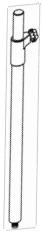
L 35 UB



B 15 SFi L35



B 18 SFi L35



SPS20

Figure 2. L-Line accessories.

- L 65 BF: Bumper frame for flying or ground-stacking L 65 or L 65 FS cabinets.
- L 65 UFB: Under-frame bar to attach L 35 cabinets under L 65 or L 65 FS arrays and/or to pullback the line array system.
- L 35 BF: Bumper frame for flying L 35 or L 35 FS cabinets.
- L 35 UB: U-bracket to install L 35 cabinets on SPS20 pole bar mounted on any SE AUDIOTECHNIK subwoofer with M20 thread.
- SPS20: Pole bar with M20 thread and adjustable height.
- B15 / B18 SFi L35: Frame for ground stacking L 35 line array units on B 15, B 15A, B 18 or B 18A subwoofers.

Rigging Elements

L 65 and L 65 FS

L 65 and L 65 FS are equipped with the following rigging elements:

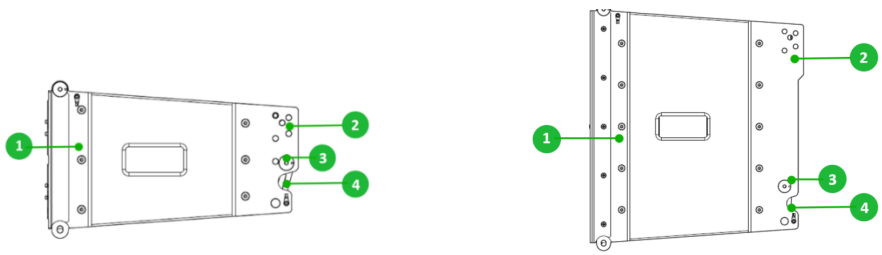


Figure 3. Front and rear rigging parts of **L 65** (left) and **L 65 FS** (right).

1. **Front rigging points**: Aluminum bar on both sides, each with one security pin on top.

2. **Rear rigging parts**: Steel tracks placed on both sides for rear connection between cabinets. Five holes on the top allow setting seven splay angles in total by combining them with the bottom rigging recesses of the above unit. Each track has one splay-bar and one security pin, used both to link with other units and to stow the splay-bar when not used.

3. **Security pin**: 8 mm ball lock pins in stainless steel for safe locking between units.
   Pin locking and unlocking procedure:

    1. Push and hold the button to release the blocking ball. ❶
    2. Insert the pin into the rigging tracks to secure and attach a cabinet. ❷
    3. Release the button to close the mechanism. Pull the pin outwards to verify a close and safe connection. ❸
    4. To unlock, push and hold the button to release the mechanism and remove the pin from the hole.

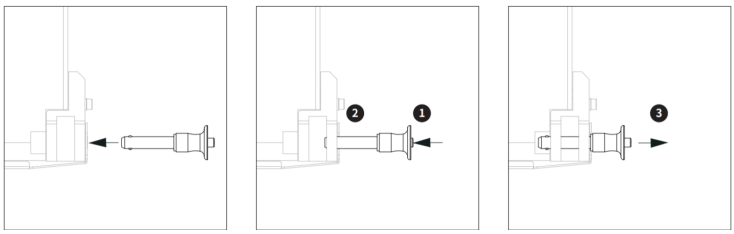


Figure 4. Operation of L-Line security pins.

4. Splay-bar. Foldout bars on the bottom of each rear rigging part determine the tilt of the cabinet relative to the previous one in the series. Each bar has two holes:

    - 0 / 1 / 2 / 6°: used to set one of the available splay angles.
    - 3 / 4 / 8°: used to set one of the available splay angles with the unit above. This is also the "Stow" position, used to lock the splay-bar inside the tracks for storing or transportation.

    Since the splay-bar of the last unit in an array is not used, it must be safely stored by inserting the security pin in the Stow position, hole "3 / 4 / 8°".

L 35 and L 35 FS

L 35 and L 35 FS are equipped with the following rigging elements:

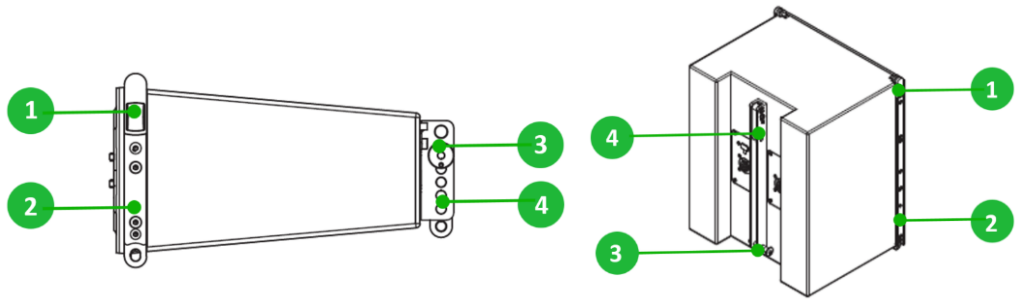


Figure 5. Rigging parts of L 35 (left) and L 35 FS (right).

1. Locking bolts: Flat locking elements with 6 mm metal pin for connecting the front rigging mechanism.

Figure 6. Unlocking the front locking elements of L 35 and L 35 FS.

a. Pull and turn the part counterclockwise to release it from the recess.
b. Remove the pin from the hole.

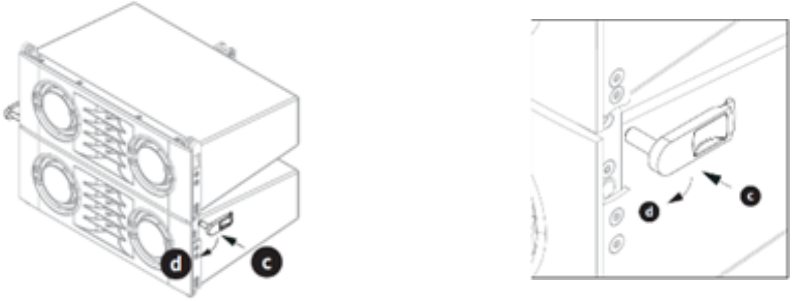


Figure 7. Locking the front locking elements of L 35 and L 35 FS

c. Inserting the pin along the holes to link Remove the pin from the hole.
d. Rotate clockwise and push back until the locking element is completely adjusted in the blocking recess.
e. Always verify a close and safe connection by slightly pulling the bolt outwards.

2. Front rigging points: Aluminum bar on both sides, each with one locking element.

3. Security pin: 6 mm ball lock pin in stainless steel for safe locking between units. Locking and unlocking is performed according to the same procedure as for the L 35 units.

4. Rear rigging parts: Steel tracks for splay angle setup with one security pin each and one bar for rear connection. In L 35 units, the available holes allow to define the following angles between two units: 0°, 2.5°, 5°, 7.5° and 10°.

Installation

For all installations, use only SE AUDIOTECHNIK accessories. Also, please follow thoroughly the steps specified for each of these setups and respect the security directions and warnings given in the section Important Safety Instructions.

L 65 BF

The **L 65 BF** bumper frame allows the suspension of an L-Line line array.

The frame has two front mounts for attaching L 65 units with the integrated rigging system, two rear splay rails with safety pins for splay adjustment, and 24 mounting points for array tilt adjustment. It features four removable steel feet for floor stacking applications and a two-pin adapter for 5/8" shackles.

Maximum load capacity of L 65 BF

Safety design Factor	12:1	10:1	7:1
Max. load	410 kg	495 kg	705 kg

Flown Line Arrays

Respect the maximum weight supported by the L 65 BF bumper frame. Always ensure not to exceed maximum load limits. Do not forget to take into account the weight of the cables and safety components.

The suspension of the frame and array attached to it must be done with a structure and hoisting chains that offer an appropriate safety factor and must always comply with valid standards and regulations. SE AUDIOTECHNIK is not responsible for any problems, injuries or accidents caused by improper suspension and rigging points, components and structures.

The tilt of the whole array depends mainly on the amount of units and the chosen pick point on the bumper frame. However, several additional factors affect the total tilt of the array, as the splay angle between units, the added weight of the cables, or even the speed of wind.

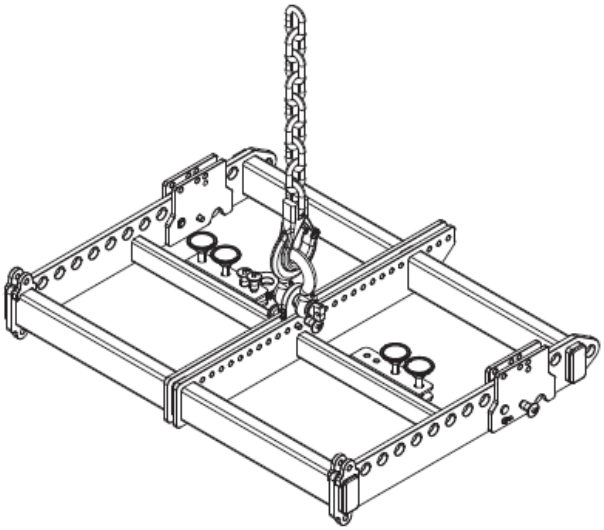


Figure 8. Suspension of the L 65 BF bumper frame using one pick point.

To prepare the system before the installation:

1. Prepare the audio cables.
   Keep in mind:
   - The signal flow needed from the amplifier(s) and between the units.
   - The distribution of the signal through the NL4 cables and their +1/-1 and +2/-2 pins.
   - The maximum capabilities of the power amplifier(s).

2. Set the total aiming angle on the bumper frame.

   a. Place the bumper frame on the ground.
   b. Detach the shackle adapter from its storing socket.
   c. Mount the two-pole adapter in the correct pair of holes according to the simulations. To do this, follow the markings on the frame to select the number and use the corresponding pair of holes.

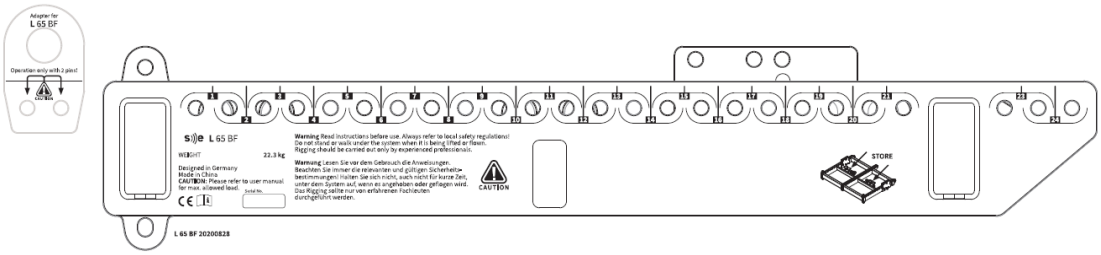
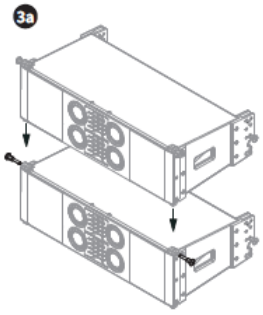


Figure 9. Side-view of the L 65 BF bumper frame (right) and its adapter (left), detailing the pick points available to choose with the two-pin adapter. This piece must be used with 5/8” shackle.

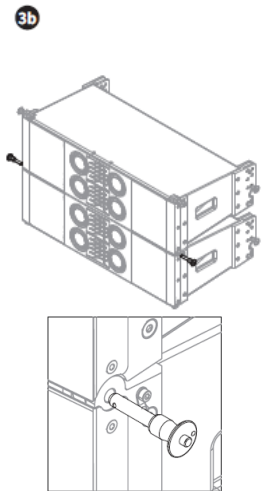
Use always both security pins to attach the adapter to the frame!

3. Assemble L 65 pairs to fly.

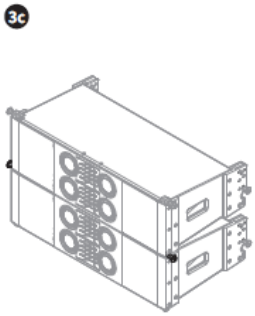
In order to ease and speed the deployment, a good practice is to set up in advance couples of L 65 units and rig them as a whole. To do this:



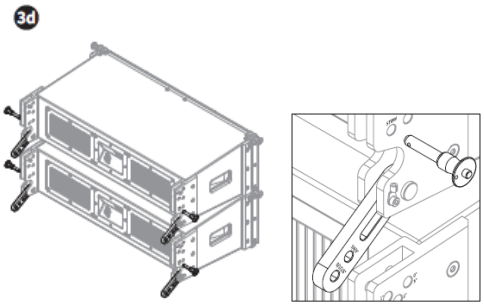
a. Take out the front security pins of one of the units.



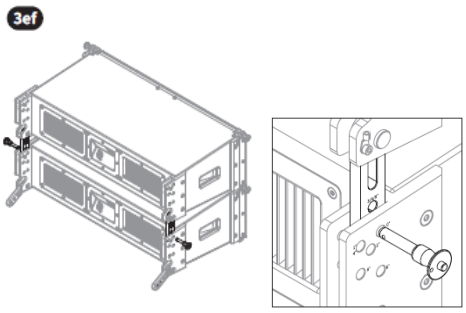
b. Place the other L 65 on top of it, matching their front rigging parts and holes.



c. Secure this part by inserting the security pins of the unit below, in the front holes of the top unit.



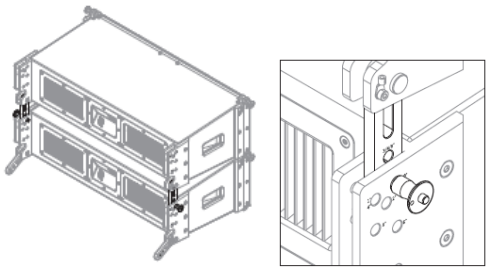
d. Unfold the splay-bars of both L 65, located on the rear.



e. Place the splay-bars of the top unit, between the steel tracks of the bottom one. Depending on the splay angle needed between the units, identify the hole to use.

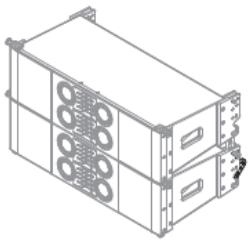
f. Align the right holes of both rigging parts to set the correct splay angle.

3g



g. On each side, fasten the rear part by inserting the security pins along the selected holes.

3h

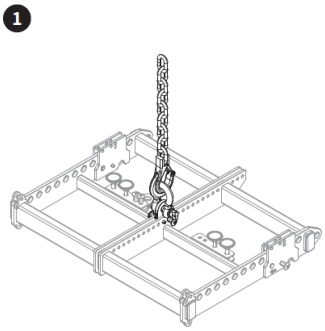


h. In the unit below, fold up again the rear bars to prevent them from hanging freely. There is no need to fasten them with the security pins.

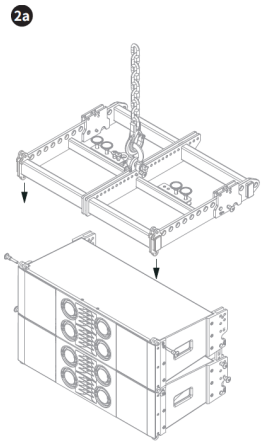
i. In both units, verify that the front and rear security pins are correctly locked by pulling those outwards without pressing the button.

Attach L 65 / L 65 FS units to L 65 BF bumper frame

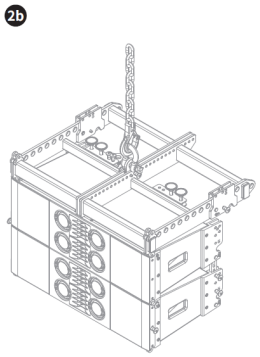
1. **Connect the L 65 BF bumper frame to the hoist chain**.
   Use appropriate 5/8” shackle in the pick point selected for the tilt needed.



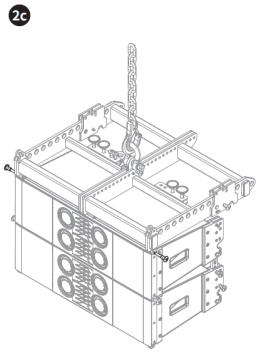
2. **Link the front part of the first 2xL65 or L 65 FS units**.



a. Lift the bumper frame 50 cm from the ground and place the first **2xL65** or **L 65 FS** below. Remove its top front security pin on both sides.

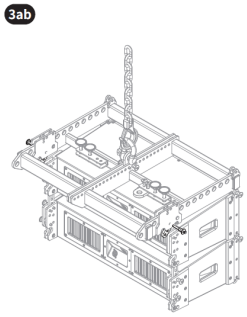


b. Lower the bumper frame and match its front holes with the top front holes of the first unit.

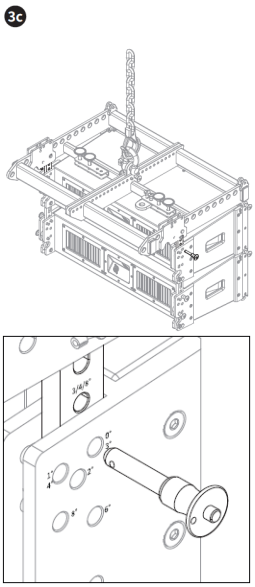


c. On both sides, insert and lock the top front security pin.
d. Make sure the pins are safely fastened by pulling outwards without pressing the button.

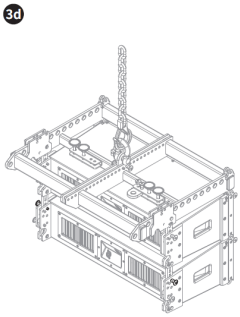
3. Link the rear part and set the splay angle for the first unit.



a. Detach the deployable splay-bar on each side of the bumper frame.
b. Lower the bumper frame until the rear bars are between the rear tracks of the unit.

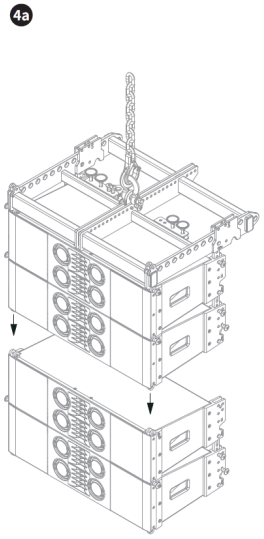


c. In the first unit, identify the hole needed to define the tilt required and align it with the hole of the bar of the bumper frame.

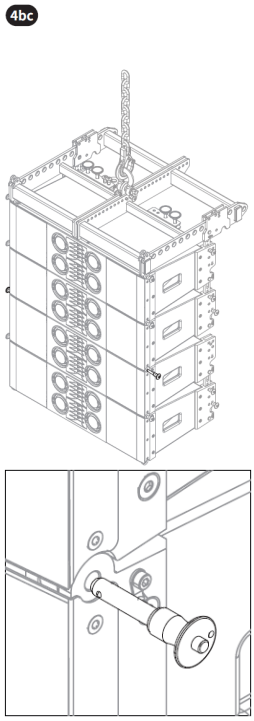


d. On each side, insert the security pin along the holes aligned.
e. Verify that they are properly fastened by pulling those outwards without pressing the release button.

4. Add another L 65 FS or 2xL65 unit below.

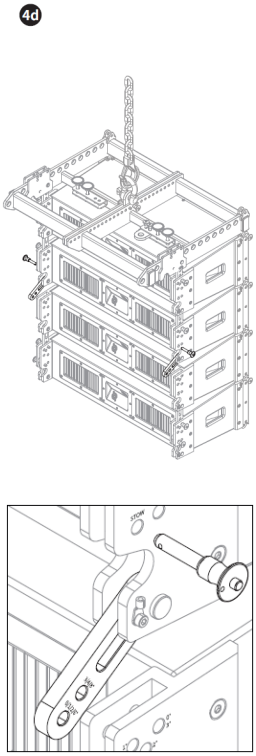


a. Lift the current array 40 cm and place the new unit below. Remove its top front security pin on both sides.



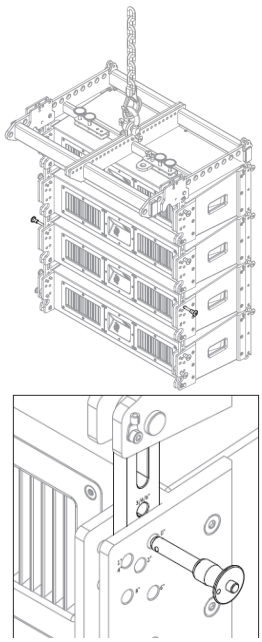
b. Lower the array and match the bottom front holes of the unit above, with the top front holes of the new 2xL65 or L 65 FS unit below.

c. On both sides, insert the security pin along the front holes previously aligned.



d. Unfold the splay-bars at the rear of the unit above. Identify the holes needed to define the splay angle between the units.

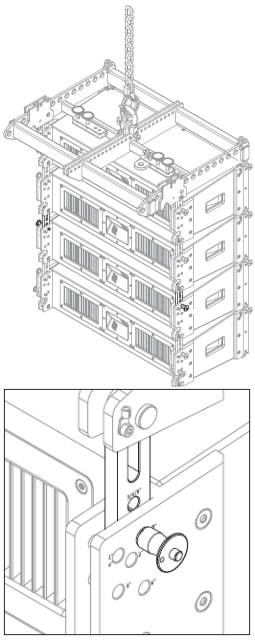
4ef



e. Move down the array and place the splay-bars between the top rear tracks of the unit below.

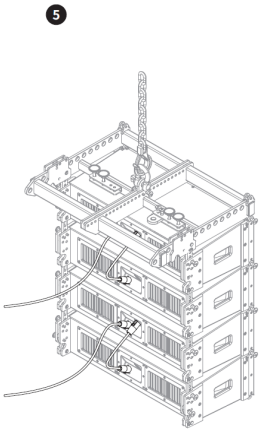
f. In the new unit, find the right hole for the intended aiming angle. On each side, align it with the hole of the splay-bar of the unit above.

4g



g. On both sides, insert the security pin along the holes previously aligned.

5. Properly connect the audio cables for the added units.



6. Add the units needed to complete the array.
   Repeat steps **4** and **5** until the whole system is properly suspended and connected.

7. Inspect the line array before hoisting it to the final position.
   Review thoroughly:

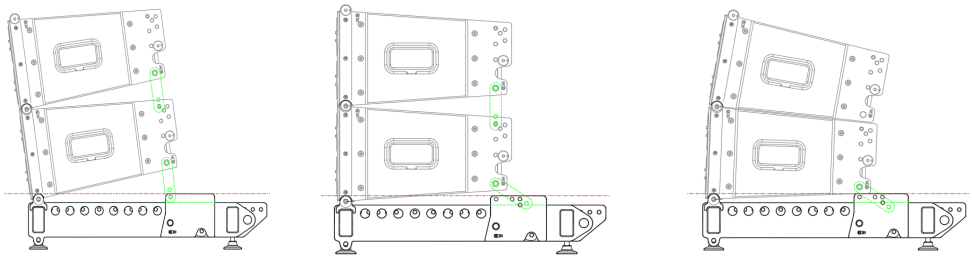
   a. Bumper frame: Check the connection of the hoist chain and the first unit.
   b. Locking bolts and security pins: Be sure they all are correctly locked in place.
   c. Splay angles: Validate that the values established are correct.
   d. Signal source: Double-check the input pins selected on each of the units.
   e. Connections: Verify the correct audio signal flow between boxes.
   f. Make sure that there are no loose parts that could fall off.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions mentioned before.

L 65 BF GROUND-STACK

The L 65 BF can also be used as a ground-stacking frame for arrays of up to six L 65 or three L 65 FS or a combination of both. The L 65 BF is equipped with four detachable metal feet.

Max. stacked L 65 units on an inclined floor (10° slope)



Splay/Tilt (°)	-8°	0°	+8°
2* L 65	✓	✓	✓
3* L 65	✓	✓	✓
4* L 65	✓	✓	✓
1* L 65 FS	✓	✓	✓
2* L 65 FS	✓	✓	✓

Max. weight and height of L 65 ground-stack on a flat floor (0° slope).

Be especially careful when using negative or maximum spread/tilt angles of the array. Always check your ground-stack setup thoroughly for possible tipping in all directions and secure the ground stack properly.

Max. units	Max. weight	Max. height
6* L 65	136.2 kg	1.42 m
3* L 65 FS	90.0 kg	1.34 m
2* L 65 FS + 3* L 65	128,1 kg	1.60 m

Recommended L 65 units in a ground-stack

Check your ground stack setup thoroughly for possible tipping in all directions and secure the ground stack properly.

Units	Weight	Height
4* L 65	90.8 kg	0.95 m
2* L 65 FS	60.0 kg	0.89 m

Keep in mind: the maximum number of units in a ground-stack depends on the slope of the ground and the overall splay and tilt angles. Please refer to the table for the maximum amount of stackable units. A ground-stack must always be secured so that it cannot fall over in any direction.

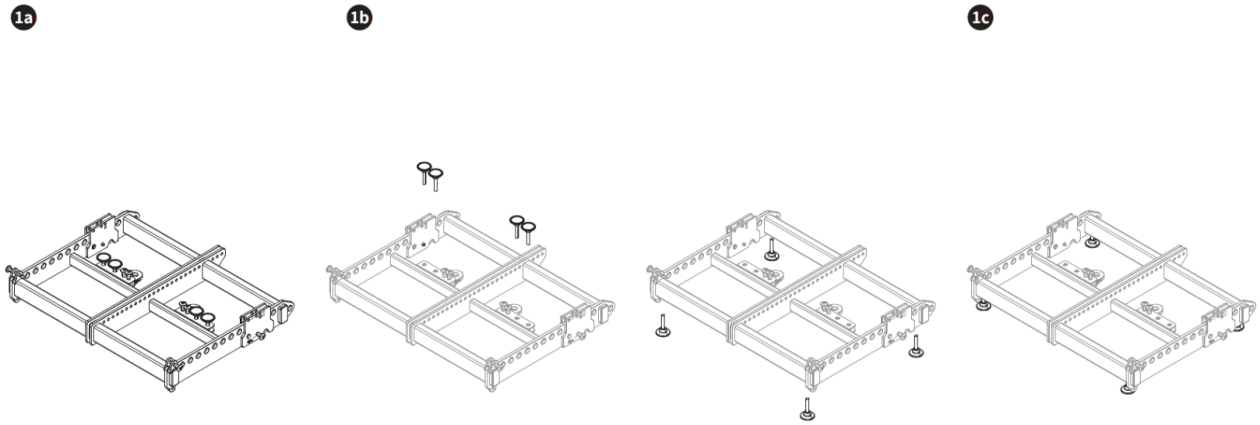
If the ground-stack consist of a combination of L 65 and L 65 FS the max. height must not exceed 1.6 m (2x L 65 FS + 3x L 65). Securing against falling over must be carried out with special care.

The frame should always be positioned on a **flat and solid surface**. There must be no danger of the ground-stack tipping over in any situation. In addition, each of the four feet must stand firmly and completely on the base below

To prepare the system before the installation:

1. Prepare the audio cables.
   Keep in mind:
   - The signal flow between the amplifier(s) and connected line array cabinets.
   - The distribution of the signal through the NL4 cables and their +1/-1 and +2/-2 pins.
   - The maximum capabilities of the power amplifier(s).

   Prepare the L 65 FS bumper frame for ground-stack set-up

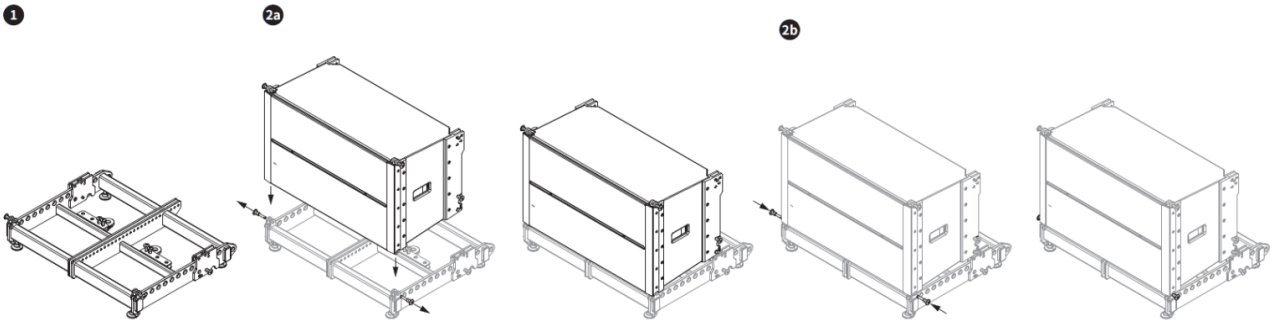


   a. Place the L 65 FS bumper frame on the ground.
   b. Detach the four feet from their storing positions and screw one on each feet thread, located on the corners.
   c. Use a level marker to check the flat alignment of the frame.

To install the system:

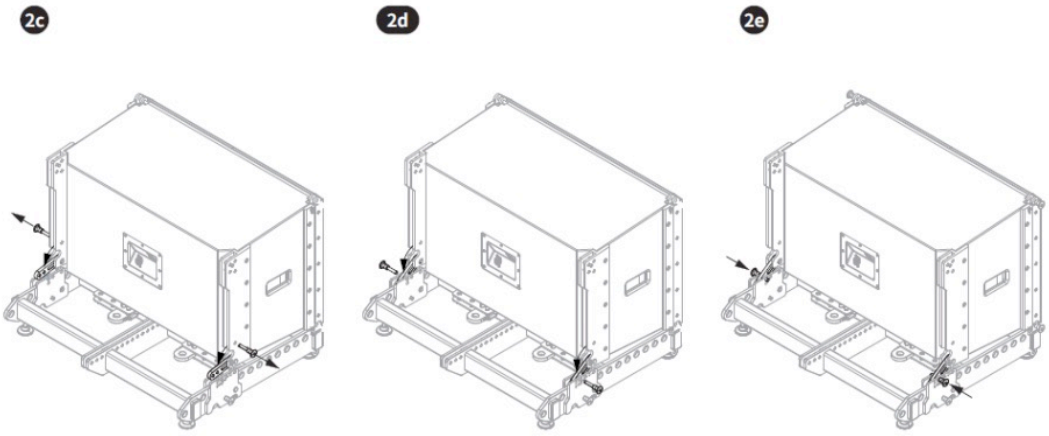
1. Place the frame on the floor or on a flat and stable surface.

Make sure the four metal feet are touching the floor or base and that the frame remains stable and secure.



2. Install the first L 65 unit.

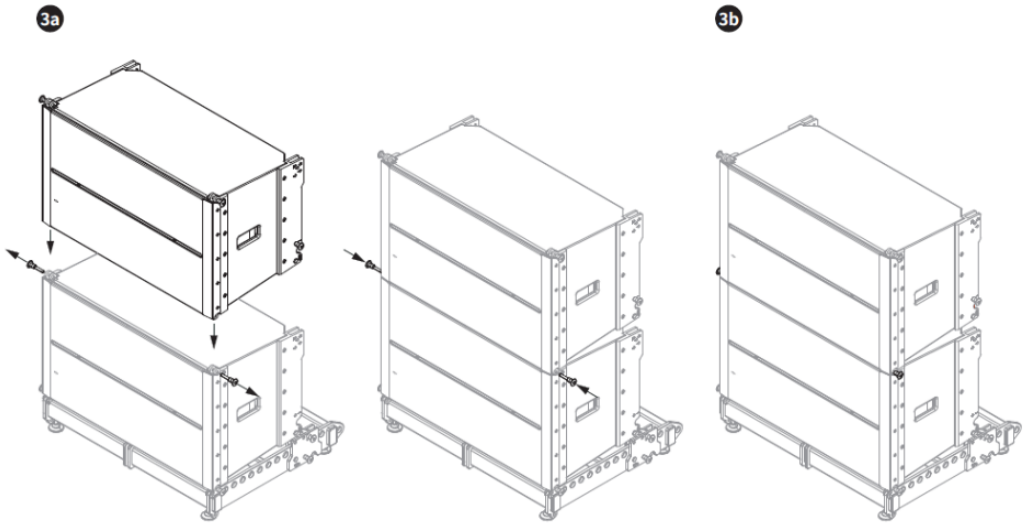
   a. Place the first L 65 unit over the stacking frame, matching their front rigging parts.
   b. Lock the two lower front rigging points of the unit with the respective security pins. Verify both are properly locked by pulling those outwards without pressing the button.



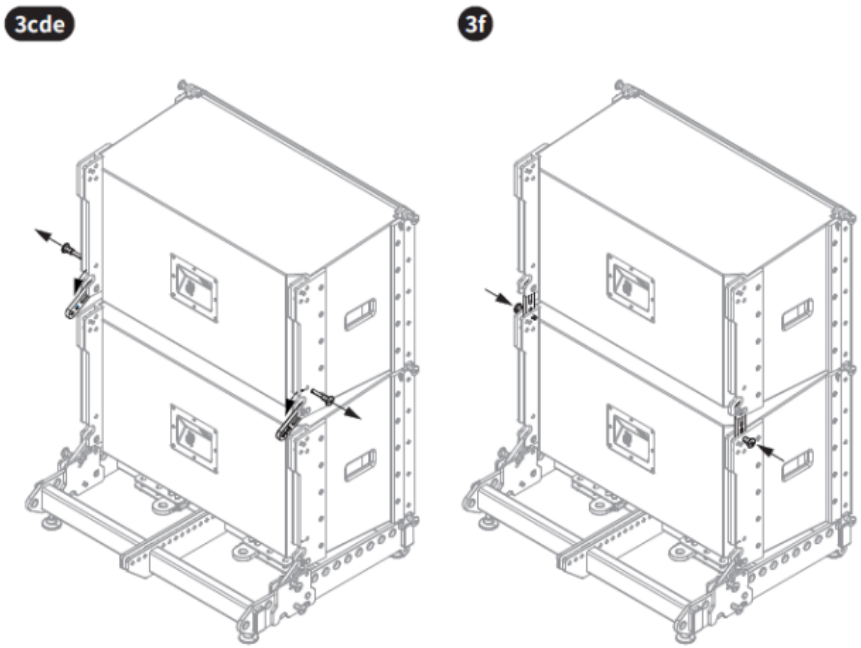
   c. Unfold and move downwards the rear splay bars of the first cabinet. Place it between the tracks of the frame below.
   d. Set the aiming angle (splay angle) by matching the hole of the bar with the holes available in the sidetracks of the frame.

e. Lock each rear part by inserting the respective security pin of the cabinet along the selected holes. Verify it is properly locked by pulling the security pins outwards without pressing the button.

3. Add another L 65 unit above.



a. Remove the upper front locking pins of the L 65 unit that was previously attached. Place the new unit on top and align the front holes in the correct positions.
b. On each side, insert and fasten the security pins at the front. Make sure they are locked correctly.



c. Unfold and move downwards the splay-bars at the rear of the new unit.
d. Place the splay-bar between the rear tracks of the already attached cabinet.
e. On each side of the lower unit, select the hole for the required splay angle. Align it with the corresponding hole of the track of the new unit.
f. On both sides, insert the security pin along the aligned holes. Verify that the pins are properly locked by pulling those pins outwards without pressing the button.

4. Add the units needed to complete the stack.
   If needed, repeat step 3 to install additional L 65 units on top of the first one.

5. Connect the audio cables.

6. Inspect the system.
   Review thoroughly:

   a. Stacking frame: Check that the four feet are firmly and securely on the floor or base.
   b. Security pins: Be sure they all pins are locked correctly in place.
   c. Splay angles: Check that the intended splay angles and the overall aiming angle are correct.
   d. Connections: Verify the correct audio signal flow between cabinets.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions previously mentioned.

L 65 UFB

The L 65 UFB under-frame bar allows attaching L 35 units to an L 65 line array. This downfill system can extend the vertical coverage of the system, allowing reaching closer audiences. In addition, it can be used as support for pullback application, allowing additional and more precise tilting adjustment when needed.

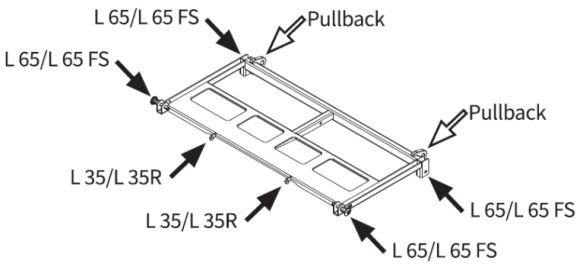


Figure 10. L 65 UFB mounting points.

The frame has two front and two rear mounts on the top for attaching it to an L 65 unit. On the bottom, there are two mounting points on the front and one splay-bar on the rear to hold L 35 units. At the back, there are two lugs for back pulling with 3/8” shackles.

Maximum load capacity of L 65 UFB

Safety design Factor	12:1	10:1	7:1
Max. load	58 kg	70 kg	100 kg

Maximum pullback force of L 65 UFB

Max. pull-back force	2500 N

Respect the maximum weight supported by the L 65 UFB under-frame bar. Always ensure not to exceed maximum load limits. Do not forget to take into account the weight of the cables and safety components.

Pulling back allows the array to tilt more, but also causes a different distribution of forces in the suspension elements. Therefore, when using the pullback option, take care to keep the array as steep or vertical as possible. In any case, additional professional advice should be requested and a detailed calculation of the force distribution should be carried out.

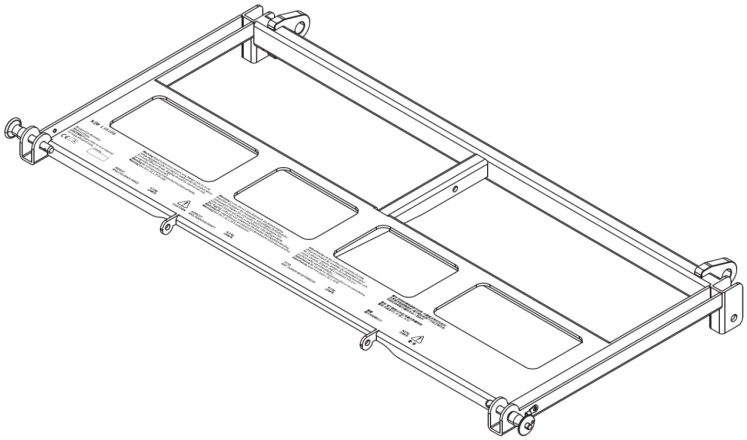


Figure 11. L 65 UFB under frame bracket

Attaching L 65 UFB to an L 65 line array:

1. Lift the array 1 m from the ground and deploy the splay-bar on each side of the last L 65 unit of the array.
2. Place the L 65 UFB below the last L 65 and match their front rigging parts.
3. On both sides, insert and lock the security pin. Make sure the pins are safely fastened by pulling outwards without pressing the button.
4. Lift the L 65 UFB and align its rear mounting holes with the splay bar of the L 65 to which the L 65 UFB is to be attached. Use the lowest hole labelled 0 / 1 / 2 / 6°.
5. On both sides, insert the security pin of the L 65 along the aligned holes. Verify that the security pins are properly locked by pulling those outwards without pressing the button.

To add L 35 units to the under-frame bar, please refer to the next section L 35 BF. Follow the preparation and deployment instructions using the L 65 UFB under-frame bar instead of the L 35 BF bumper frame.

L 35 BF

This frame has two front-mounting holes and one rear-mounting hole for attaching L 35 units with its integrated rigging system. The L 35 BF offers 12 pick points for array tilt adjustment.

Maximum load capacity of L 35 BF

Safety design Factor	12:1	10:1	7:1
Max. load	308 kg	370 kg	528 kg

Respect the maximum weight supported by the L 35 BF bumper frame. Always ensure not to exceed maximum load limits. Do not forget to take into account the weight of the cables and safety components.

The suspension of the frame and array attached to it must be done with a structure and hoisting chains that offer an appropriate safety factor and must always comply with valid standards and regulations. SE AUDIOTECHNIK is not responsible for any problems, injuries or accidents caused by improper suspension and rigging points, components and structures.

The tilt of the whole array depends mainly on the amount of units and the chosen pick point on the bumper frame. However, several additional factors affect the total tilt of the array, as the splay angle between units, the added weight of the cables, or even the speed of wind.

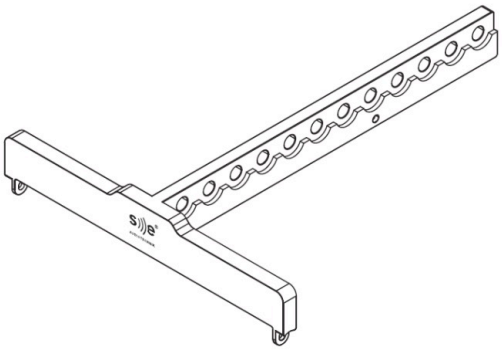


Figure 12. L 35 BF bumper frame

To prepare the system before the installation:

1. Prepare the audio cables required.
   Keep in mind:
   - The signal flow between the amplifier(s) and connected line array cabinets.
   - The distribution of the signal through the NL4 cables and their +1/-1 and +2/-2 pins.
   - The maximum capabilities of the power amplifier(s).

2. Select the signal source on each L 35 and/or L 35 FS.
   Depending on the signal-flow designed for the system.

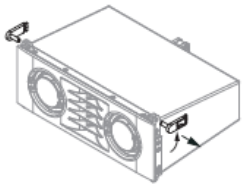
> Use the rear switch of L 35 and L 35 FS to select the source of the input signal from the NL4 connector, namely pins 1+/1- or 2+/2-. The signal chosen is the one delivered to the transducers. For further information, refer to the L-Line Loudspeaker manual.

To deploy the system:

1. Connect the L 35 BF bumper frame to the hoist chain.
   Use appropriate 3/8” shackle at the pick point selected for the tilt needed.

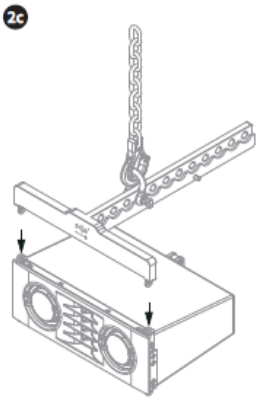
2. Attach the front side of the first L 35 or L 35 FS unit.

2ab



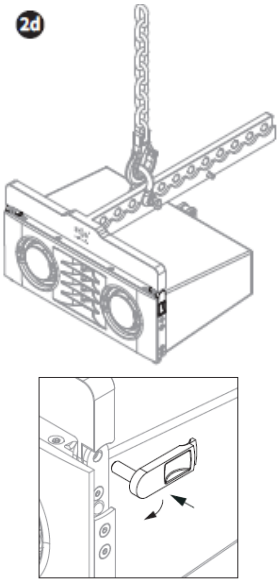
a. Lift the bumper frame 1 meter from the ground.
b. Release and remove the locking bolts of the unit, located at the front.

2c



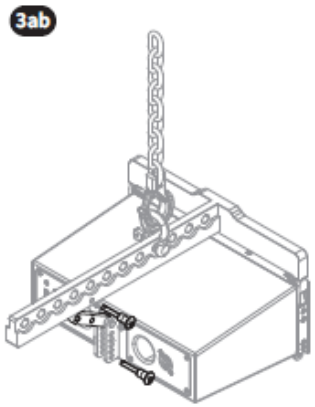
c. Match the front bumper frame mounting points of the L 35 BF and the upper front mounting points of the L 35 or L 35 FS.

2d

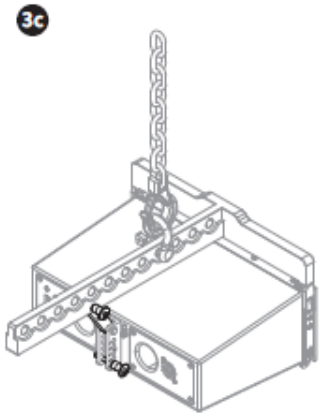


d. On each side, insert and fasten the locking bolt of the unit. Make sure they are positioned in the blocking recess.

3. Link the rear side and set the splay angle for the first unit.

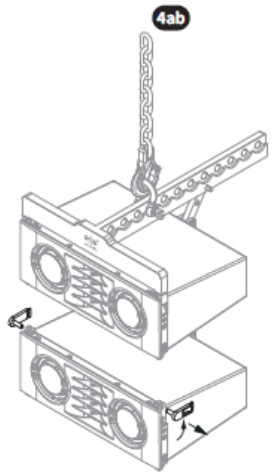


a. Remove the security pin at the rear of the unit and the bumper frame, and unfold the splay-bar.
b. Align the upper mounting point of the splay-bar with the rear mounting point of the bumper frame.

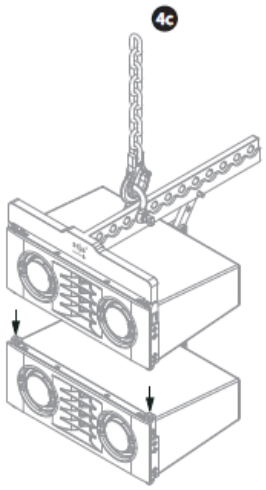


c. Insert the security pin along the holes aligned. Verify it is properly locked by pulling it outwards without pressing the button.

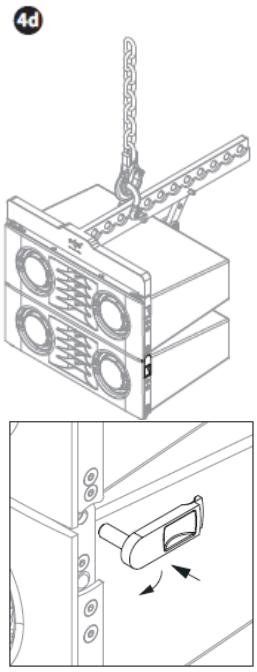
4. Add another L 35 FS or L 35 unit below.



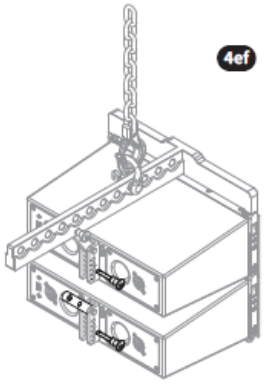
a. Raise the bumper frame 20 cm.
b. Release and remove the upper front locking bolts of the new unit.



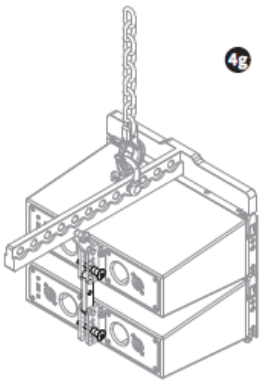
c. Match the bottom front mounting points of the already attached unit with the upper front mounting points of the new L 35 FS or L 35 unit.



d. On each side, insert and fasten the locking bolt of the unit. Make sure they are fully positioned in the blocking recess.

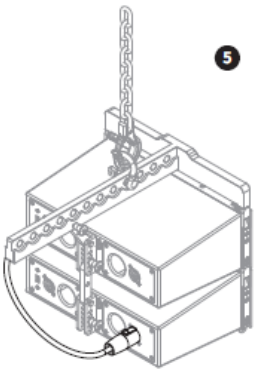


e. Remove the security pin at the rear of the new unit and unfold the splay-bar. Place it between the rear tracks of already attached unit.
f. In the unit above, select the hole for the splay angle needed. Align it with the upper hole of the splay-bar of the unit below.



g. Insert the security pin along the aligned holes. Verify it is properly locked by pulling it outwards without pressing the button.

5. Connect the audio cables for the added units.



6. Add all units needed to complete the array.
   Repeat steps 5 and 6 until the whole system is properly suspended and connected.

7. Inspect the line array before hoisting it to the final position.
   Review thoroughly:

    a. Bumper frame: Check the connection of the hoist chain and the first unit.
    b. Locking bolts and security pins: Be sure they all are correctly locked in place.
    c. Splay angles: Validate that the values established are correct.
    d. Signal source: Double-check the input pins selected on each of the units.
    e. Connections: Verify the correct audio signal flow between cabinets.
    f. Make sure that there are no loose parts that could fall off.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions mentioned before.

L 35 UB

The L 35 UB U-bracket allows stacking of up to four L 35 cabinets in combination with SPS pole mount and floor standing loudspeaker systems with M20 threads such as SE AUDIOTECHNIK passive or self-powered B-Line subwoofers.

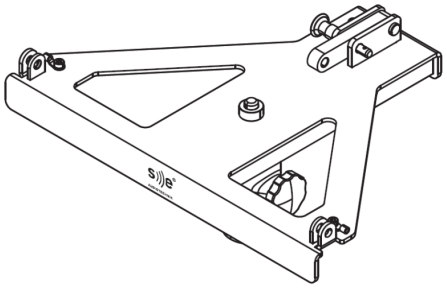


Figure 13. L 35 UB U-bracket

On the top, the bracket has two mounting points on the front and one foldout bar on the rear. This bar has two mounting holes: one for adjusting the tilt/splay of the array and one for stowing the bar. On the bottom, there is a receptacle to attach the U-bracket to the SPS20 pole mount.

NEVER USE L 35 UB U-BRACKET TO HANG L 35 LINE ARRAY STACKS.

NEVER USE MORE THAN FOUR L 35 CABINETS STACKED ON L 35 UB U-BRACKET.

Notice that the angle between the U-bracket and the first L 35 cabinet aims the stack towards the floor. Furthermore, for this first L 35 cabinet, the splay angles are swapped. For example, the 0° hole turns the stack -10° down and inversely, the 10° hole introduces no tilt and thus, the stack faces forward. Conversely, the splay angles between boxes will point them upwards.

To prepare the units and accessories before installing the setup:

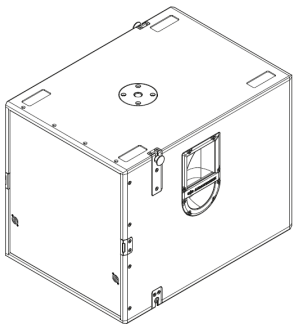
1. Prepare the required audio cables.
   Keep in mind:
   - The signal flow between the amplifier(s) and connected line array cabinets.
   - The distribution of the signal through the NL4 cables and their +1/-1 and +2/-2 pins.
   - The maximum capabilities of the power amplifier(s).

2. Select the signal source on each L 35 cabinet.
   Depending on the signal flow intended for the system, select the signal source with the switch on the back of the L 35 units.

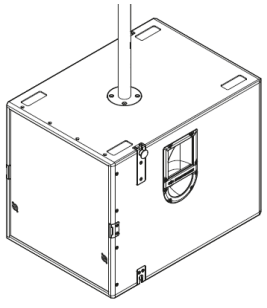
3. Prepare the SPS20 pole mount.
   Adjust the SPS20 pole mount to its minimum length and properly tighten the locking screw.

To install the system:

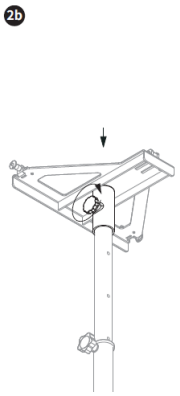
1. Place the subwoofer in the desired place.
   Ensure that the four bottom feet touch the ground and its position is secure and stable.



2. Install the U-bracket on the subwoofer.

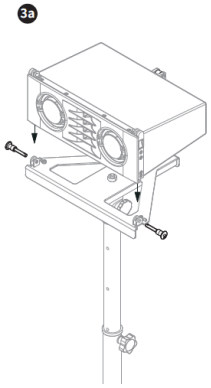


a. Screw the lower part of the SPS20 pole mount in the M20 thread of the subwoofer.

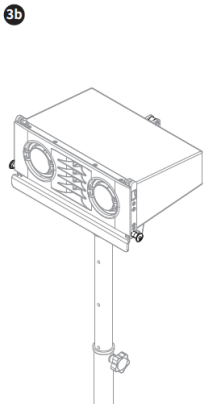


b. Place the receptacle of the L 35 UB U-bracket on the upper part of the SPS20 pole mount. Tighten the locking screw.

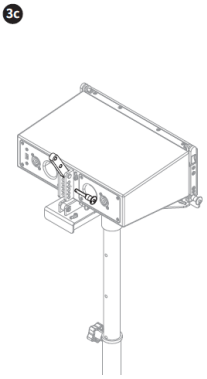
3. Install the first L 35 unit.



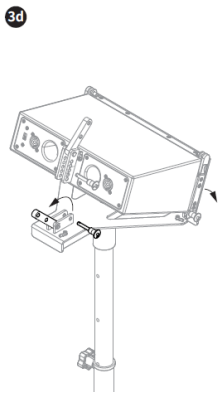
a. Remove the three security pins from the U-bracket and place the first L 35 on top, matching their front rigging parts.



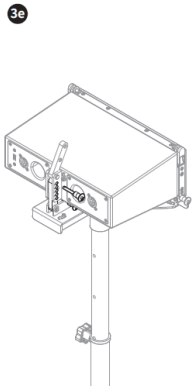
b. Lock the two lower front rigging points of the unit with the security pins of the U-bracket. Verify both are properly locked by pulling those outwards without pressing the button.



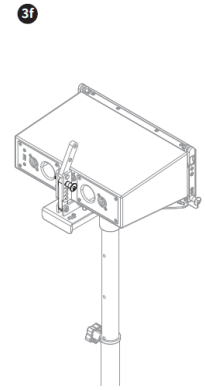
c. Unfold and move the rear splay-bar upwards of the L 35 unit.



d. Unfold and move the rear splay-bar of the U-bracket upwards. Place it between the tracks of the L 35 unit above.

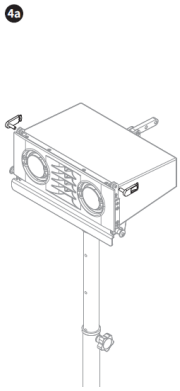


e. Set the aiming angle by matching the upper hole of the bar, with those available in the rigging part of the L 35 unit. **Remember that the printed values for this angle are opposite.**

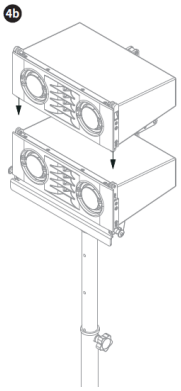


f. Insert the rear security pin of the U-bracket along the holes and lock the rear side. Verify it is properly locked by pulling it outwards without pressing the button.

4. Add another L 35 unit.

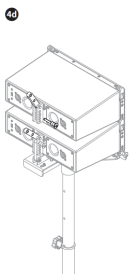


a. Remove the top front locking bolts of the previous unit.

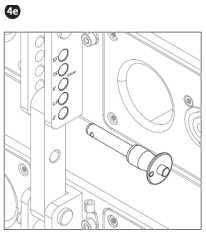


b. Place the new L 35 unit on top of the previous one and match their front rigging parts.

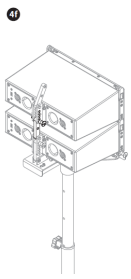
c. On each side, insert and fasten the locking bolts at the front of the previous unit. Make sure they are positioned in the blocking recess.



d. Unfold and move the splay-bar of the new L 35 cabinet upwards. Place the splay-bar of the L 35 cabinet below between the rear tracks of the L 35 unit above.



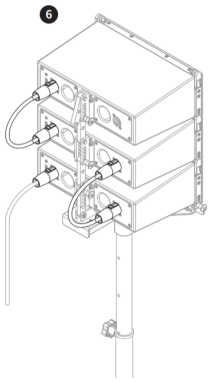
e. In the new unit, select the hole for the intended splay angle. Align it with the upper hole of the splay-bar of the previous unit.



f. Insert the security pin along the aligned holes. Verify it is properly locked by pulling it outwards without pressing the button.

5. Add the units needed to complete the stack.
   If needed, repeat step 4 to install up to three L 35 cabinets on top of the first one.

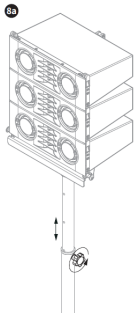
6. Connect the audio cables.



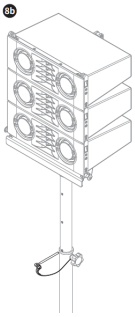
7. Inspect the system before adjusting the height.
   Review thoroughly:

   a. SPS20 pole mount: Check the fastening in the M20 thread of the subwoofer.
   b. Locking bolts and security pins: Be sure they all are correctly locked in place.
   c. Splay angles: Validate that the values established are correct.
   d. Signal source: Double-check the input pins selected on each of the units.
   e. Connections: Verify the correct audio signal flow between the L 35 units.

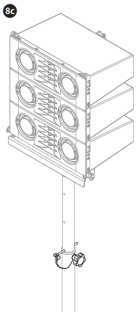
8. Set the desired height for the array.



a. Loosen the SPS20 pole mount locking screw and raise the U-bracket until the desired height is reached.



b. Insert the blocking pin in the hole closest to the locking screw and let the stack rest on it.



c. Tighten the screw again to fix the position.

9. Check the stability of the system.

Make sure the subwoofer stands firmly on the ground and supports safely the stack at the defined height. Secure the stack against tipping.

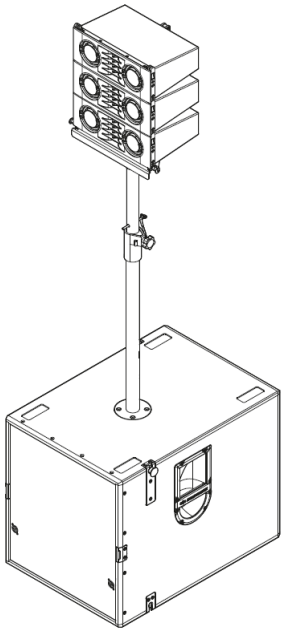


Figure 14. Installation of small arrays with the SPS20 pole mount and the L 35 UB U-bracket.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions previously mentioned.

B 15 SFi L35 and B 18 SFi L35 stacking frames

With these dedicated frames, it is possible to stack L 35 units on a B 15, B 15A or B 18 subwoofers, or on the ground.

On each side, the frames include one locking lever to attach to the integrated rigging system of the respective subwoofer. On top, two front mounting points and one rear-rigging part allow to fasten a stack of L 35 and adjust the needed tilt. Finally, the frames are equipped with a powerCON® input and link to illuminate the front panel and receive/pass power from/to the subwoofer(s) on the array.

The table below specifies the mechanical limits for this kind of setups. The values correspond to the maximum amount of L 35 units that can be mounted on top of a stack of subwoofers.

Max. amount of L 35 units stacked on SFi stacking frames

These values refer only to mechanical limits. Therefore and depending on the application, some of these configurations may be acoustically unbalanced and thus, not recommended.

Number of stacked subwoofers	1 Subwoofer	2 Subwoofers	3 Subwoofers
B 15 / B 15A	8	7	5
B 18 / B 18A	10	8	6

B 15 SFi L35 and B 18 SFi L35 stacking frames are not designed for hanging loads. Never use them to hang line array systems!

Notice that the angle between the SFi stacking frame and the first L 35 unit aims the stack towards the floor. Furthermore, for this first L 35 unit, the splay angles are swapped. For example, the 0° hole turns the stack -10° down and inversely, the 10° hole introduces no tilt and thus, the stack faces forward. Conversely, the splay angles between boxes will point them upwards.

To install the SFi stacking frame on top of a B 15, B 15A, B 18 or B 18A subwoofer, place it accordingly by matching the bottom feet of the frame with the top recesses of the subwoofer. Then, on both sides of the subwoofer:

1. Pull the handle to release the blocking lever.

2. Move the lever upwards to the receptacle of the SFi stacking frame.
3. Release the handle to close the mechanism. Try to move the lever downwards to verify a close and safe connection.

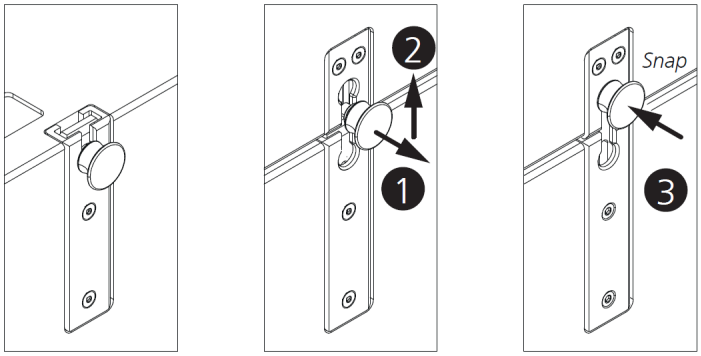


Figure 15. Linking system for B 15 SFi L35 and B 18 SFi L35 stacking frames.

The following steps can be followed both when setting a stack over a subwoofer, or placed on the ground. Before installing the system:

1. Prepare the power and audio cables required.
   Keep in mind:
   - The signal flow between the amplifier(s) and connected line array cabinets.
   - The distribution of the signal through the NL4 cables and their +1/-1 and +2/-2 pins.
   - The maximum capabilities of the power amplifier(s).

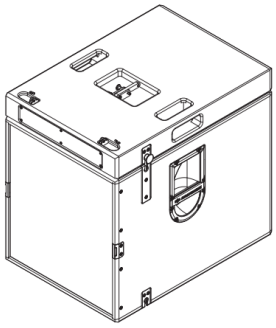
2. Select the signal source on each L 35.
   Depending on the signal flow intended for the system, select the signal source with the switch on the back of the L 35 units.

3. Position the base of the stack in the desired place.
   Whether the stack is on a subwoofer or on the floor, make sure that the four feet of the lower element touch the installation surface and that the position is firm and stable.

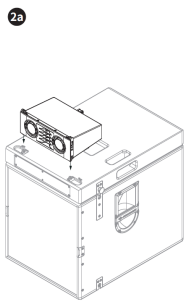
This can be performed also on top of a stack of subwoofers. For a safe deployment of these, please refer to the respective B-Line manual.

To build the L 35 stack:

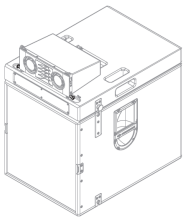
1. Prepare the stacking frame.
   If placed on top of a subwoofer, attach the SFi stacking frame properly as explained before. Then, unlock the two front security pins of the first L 35 unit.



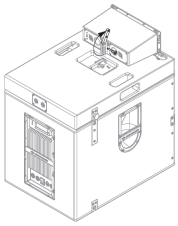
2. Install the first L 35 unit.



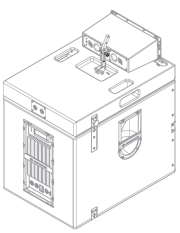
a. Place the first L 35 on the SFi stacking frame, matching their front rigging parts.

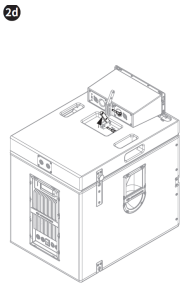


b. Lock the two lower front rigging points of the unit with the security pins of the frame. Verify both are properly locked by pulling those outwards without pressing the button.

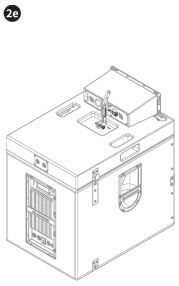


c. Unfold and move the rear splay-bar of the first L 35 unit upwards.





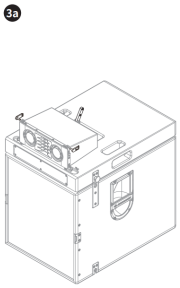
d. Remove the rear pin of the SFi to unlock the rear-mounting part. Unfold and place it between the tracks of the first L 35 unit.



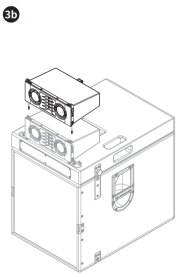
e. Set the aiming angle by matching the upper hole of the bar, with those available in the rigging part of the first L 35 unit. Remember that the printed values for this angle are opposite.

f. Insert the rear security pin of the frame along the aligned holes and lock the rear side. Verify it is properly locked by pulling it outwards without pressing the button.

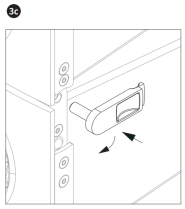
3. Add another L 35 unit above.



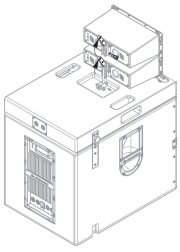
a. Remove the top front locking bolts of the previous L 35 unit and place the new L 35 unit on top of it.



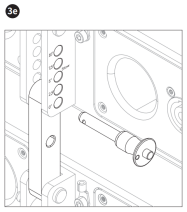
b. Match the upper front rigging holes of the unit below, with the bottom front rigging holes of the new L 35 unit.



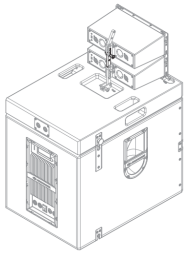
c. On each side, insert and fasten the locking bolts at the front of the previous unit. Make sure they are positioned in the blocking recess.



d. Place the splay-bar of the L 35 unit below between the rear tracks of the one above.



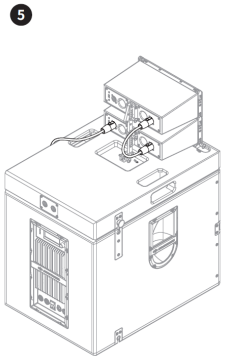
e. At the new L 35 unit, select the hole for the intended splay angle. Align it with the upper hole of previous unit's the splay-bar.



f. Insert the security pin along the aligned holes. Verify it is properly locked by pulling it outwards without pressing the button.

4. Add the units needed to complete the stack.
Repeat step 3 to add additional L 35 units on top of the first one.

5. Connect the audio cables.



6. Inspect the system.
   Review thoroughly:

   a. Stability: Make sure the whole system stands firmly on the ground.
   b. Locking bolts and security pins: Be sure they all are correctly locked in place.
   c. Splay angles: Validate that the values established are correct.
   d. Signal source: Double-check the input pins selected on each of the units.
   e. Connections: Verify the correct audio signal flow between the loudspeaker units.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions previously mentioned.

Line Array Hoisting Checklist

Before hoisting and suspending the line array to the final position, inspect thoroughly and make sure that:

- ☐ The suspension structure is stable and strong enough to support the whole system.
- ☐ The motor or hoist chain is properly attached to the structure.
- ☐ The lifting chain runs freely and is unobstructed.
- ☐ The suspension frame (bumper frame) is safely attached to the hoist chain.
- ☐ The adapter is placed in the correct pick point and locked with both pins.
- ☐ The first unit of the array is safely connected to the four rigging points of the suspension frame (bumper frame).
- ☐ All rigging points, at the rear and at the front, are properly aligned and secured.
- ☐ All the security pins are completely inserted and locked appropriately.
- ☐ The splay angles between units are correctly defined and respect the values predicted.
- ☐ The audio cables are correctly connected and the signal is correctly distributed from the amplifier and within the array.
- ☐ Any switch, knob or other specific adjustment on each of the cabinets are correctly set.
- ☐ There are no loose objects, which may fall during the hoisting or the performance.
- ☐ All rigging parts and speaker cabinets are double secured against falling down.
- ☐ A safety area below the array's area of influence has been established and marked.
- ☐ Force and max. load calculation were performed and confirmed by qualified personnel.

During the hoisting, keep a slow but constant pace, avoiding abrupt sharp movements. In addition, make sure there is no one below the array, who may get hurt due to any mechanical failure.

Line Array Ground-Stack Checklist

After building your ground-stack inspect thoroughly and make sure that:

- ☐ The surface is where the ground-stack is placed on, is non-slippery, stable and firm.
- ☐ All rigging points, at the rear and at the front, are properly aligned and secured.
- ☐ All the security pins are completely inserted and locked appropriately.
- ☐ The tilt/splay angles between units are correctly defined and respect the values predicted.
- ☐ The audio cables are correctly connected and the signal is correctly distributed from the amplifier and within the array.
- ☐ The ground stack is secured against tipping.
- ☐ A safety area around the ground-stack’ s area of influence has been established and marked.

Specifications

Technical Specifications L 65 BF and L 65 UFB

PRODUCT	L 65 BF	L 65 UFB
Type:	L 65 line array bumper frame	L 65 line array under-frame bar for L 35 downfill
Material:	Carbon steel	Carbon steel
Finishing:	Matted surface with powder coating for outdoors	Matted surface with powder coating for outdoors
Max. load capacity	50 kN	7 kN
WLL / load capacity (12:1)	410 kg	58 kg
WLL / load capacity (10:1)	495 kg	70 kg
WLL / load capacity (7:1)	705 kg	100 kg
Max. pullback force	n/a	2500 N
Color:	Black	Black
Product dimensions [H x W x D] (Including rigging) :	113 x 765 x 590 mm	64.5 x 730 x 378 mm
Net weight:	19.7 kg	4.3 kg
Packaging dimensions [H x W x D]:	193 x 790 x 610 mm	100 x 759 x 385 mm
Total weight:	22 kg	6.1 kg
Rigging:	- Four-point SE AUDIOTECHNIK rigging system with 8 mm SE AUDIOTECHNIK security pins - 24x two-pins pick points with 1/2" holes - One two-pins to shackle adapter - 4x steel feet for stacking frame	- Four-point SE AUDIOTECHNIK rigging system with 8 mm SE AUDIOTECHNIK security pins - Three 6 mm SE AUDIOTECHNIK security pins

Technical Specifications L 35 BF and L 35 UB

PRODUCT	L 35 BF	L 35 UB
Type:	L 35 line array bumper frame	L 35 U-bracket
Material:	Carbon steel	Carbon steel
Finishing:	Matted surface with powder coating for outdoors	Matted surface with powder coating for outdoors
Max. load capacity	37.9 kN	n/a
WLL / load capacity (12:1)	308 kg	n/a
WLL / load capacity (10:1)	370 kg	n/a
WLL / load capacity (7:1)	528 kg	n/a
Max. pullback force	n/a	n/a
Color:	Black or white	Black or white
Product dimensions [H x W x D] (Including rigging) :	63.5 x 311 x 385 mm	115.3 x 358 x 242 mm
Net weight:	3.2 kg	1.8 kg
Packaging dimensions [H x W x D]:	133 x 395 x 465 mm	120 x 395 x 320 mm
Total weight:	4 kg	2.5 kg
Rigging:	- Three-point SE AUDIOTECHNIK rigging system with 6 mm SE AUDIOTECHNIK security pins - 12x 3/8" pick point holes	- Three-point SE AUDIOTECHNIK rigging system - One deployable piece with 6 mm SE AUDIOTECHNIK security pin - One 35 mm pole mount receptacle

Technical Specifications B 15 SFi L 35 and B 18 SFi L 35

PRODUCT	B 15 SFi L 35	B 18 SFi L 35
MECHANICAL		
Type:	Stacking Frame for L 35 and B 15 or B 15A Subwoofer	Stacking Frame for L 35 and B 18 Subwoofer
Material:	9 and 12 mm plywood	9 and 12 mm plywood
Finishing:	Black or white polyurea coating	Black or white polyurea coating
Product dimensions [H x W x D] (Including rigging) :	99 x 465 x 654 mm	99 x 512 x 793 mm
Net weight:	9.7 kg	13 kg
Packaging dimensions [H x W x D]:	163 x 545 x 735 mm	163 x 590 x 875 mm
Total weight:	11.7 kg	15.3 kg
Hardware:	- Two side handles embedded in cabinet - Four rubber feet and top slots for stacking - Front SE AUDIOTECHNIK backlighting panel	- Two side handles embedded in cabinet - Four rubber feet and top slots for stacking - Front SE AUDIOTECHNIK backlighting panel
Rigging:	- Two-point SE AUDIOTECHNIK stacking system - Three-point rigging system with 6 mm SE AUDIOTECHNIK locking pins	- Two-point SE AUDIOTECHNIK stacking system - Three-point rigging system with 6 mm SE AUDIOTECHNIK locking pins
Aiming angles:	N/A	N/A
ELECTRICAL		
Connectors:	Power input: powerCON® 20 A Power link output: powerCON® 20 A	Power input: powerCON® 20 A Power link output: powerCON® 20 A
AC supply operating range:	100 – 240 VAC 50/60 Hz, 20 A	100 – 240 VAC 50/60 Hz, 20 A
Power consumption:	30 W	30 W

Mechanical Drawings

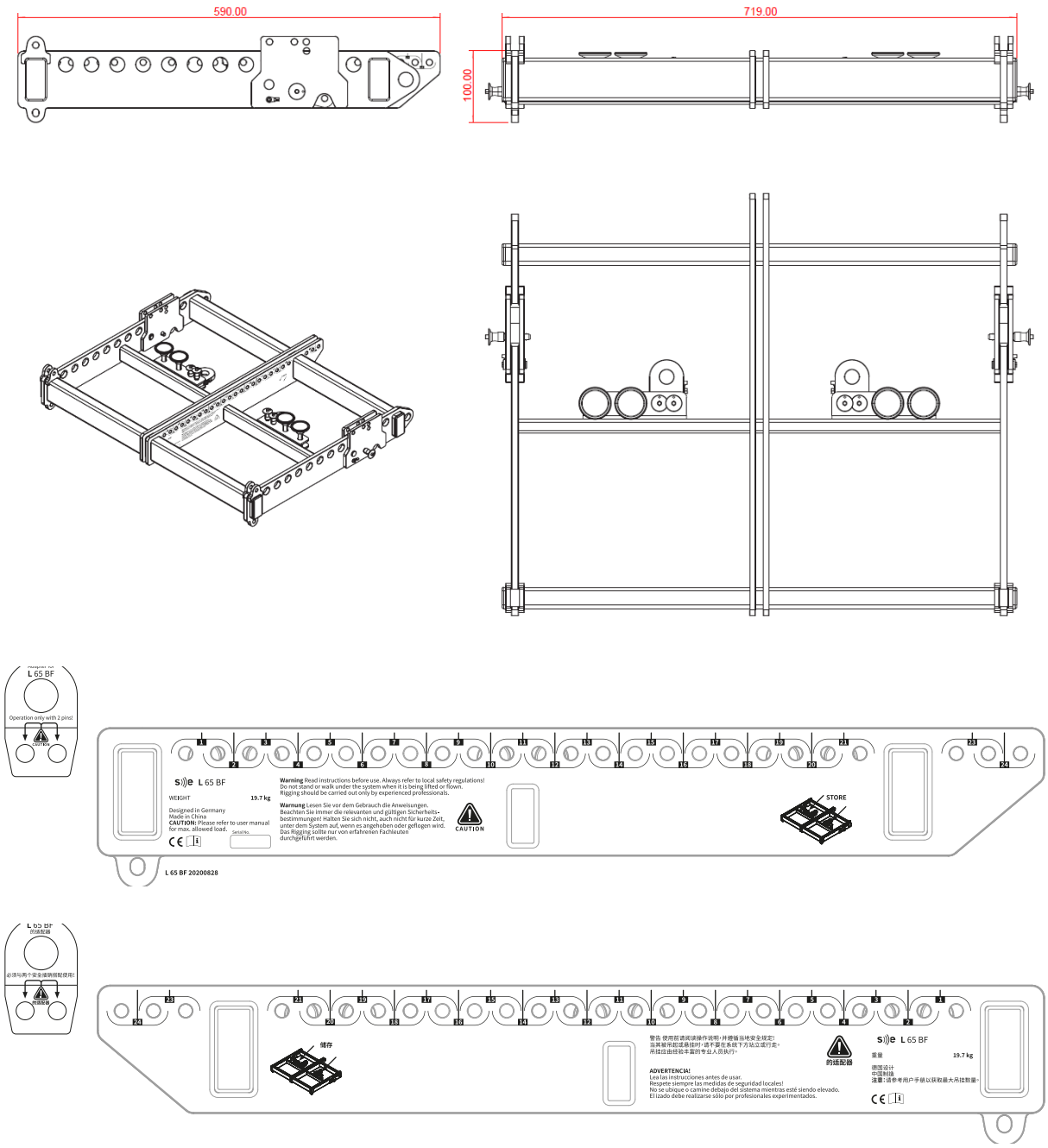


Figure 16. L 65 BF views and dimensions. Annotations given in millimeters.

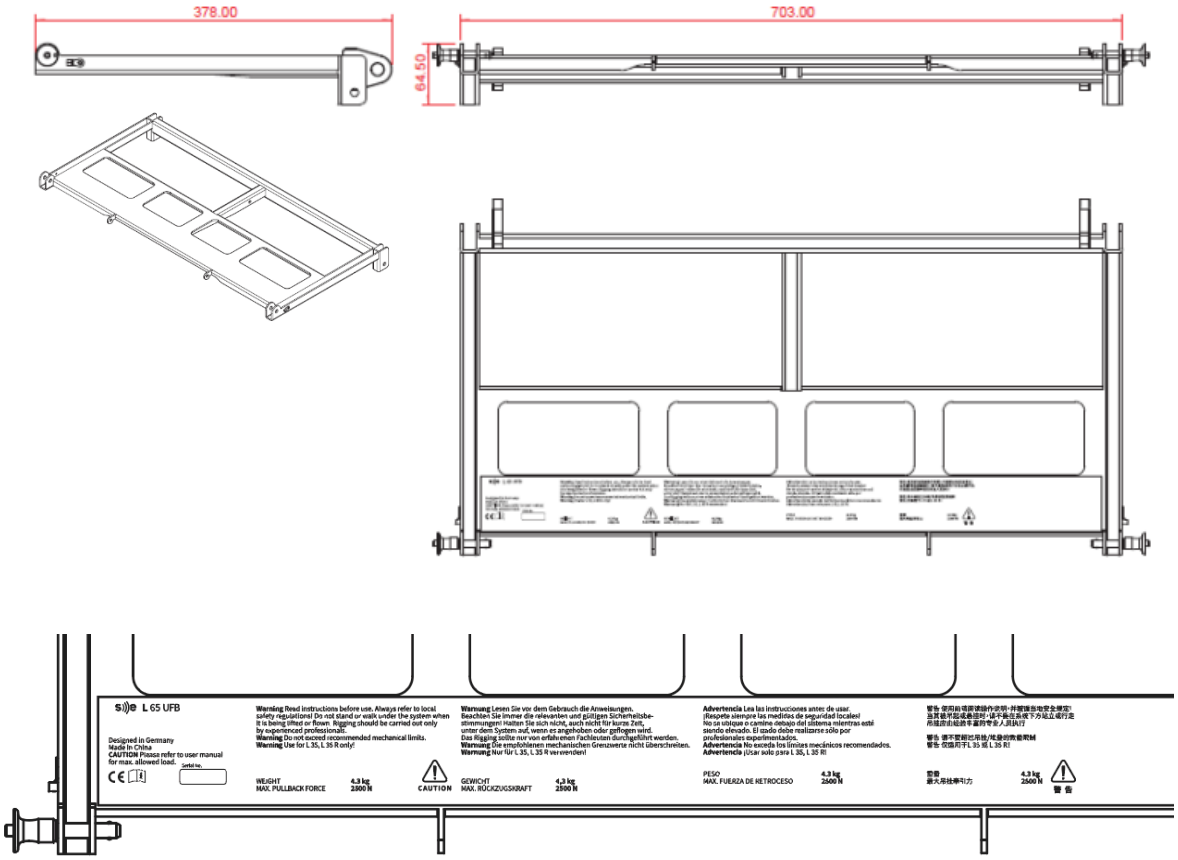


Figure 17. L 65 UFB views and dimensions. Annotations given in millimeters.

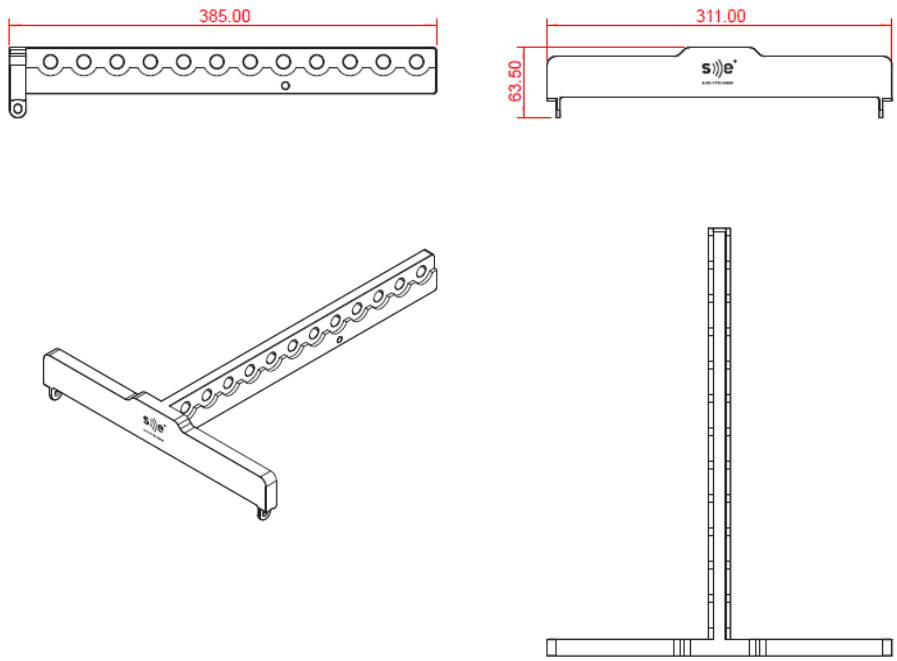


Figure 18. L 35 BF views and dimensions. Annotations given in millimeters.

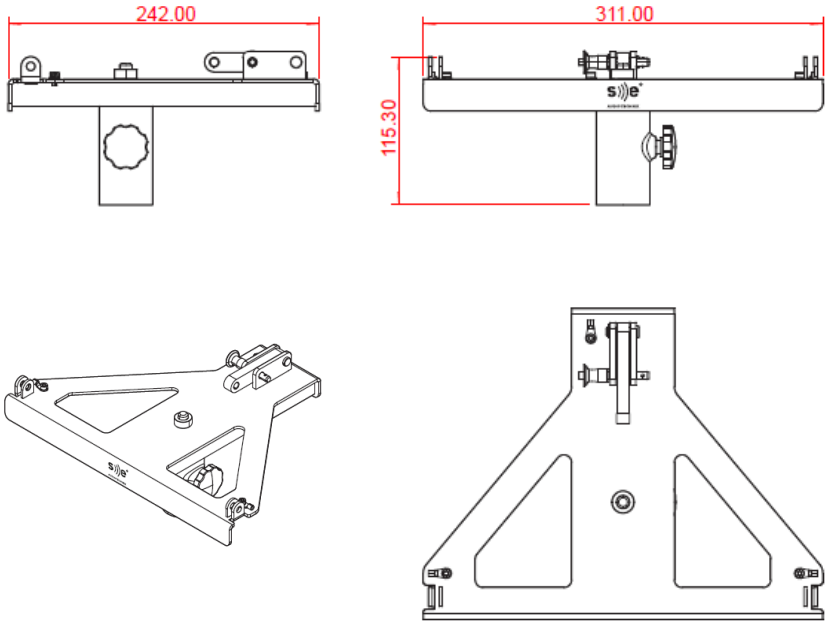


Figure 19. L 35 UB views and dimensions. Annotations given in millimeters.

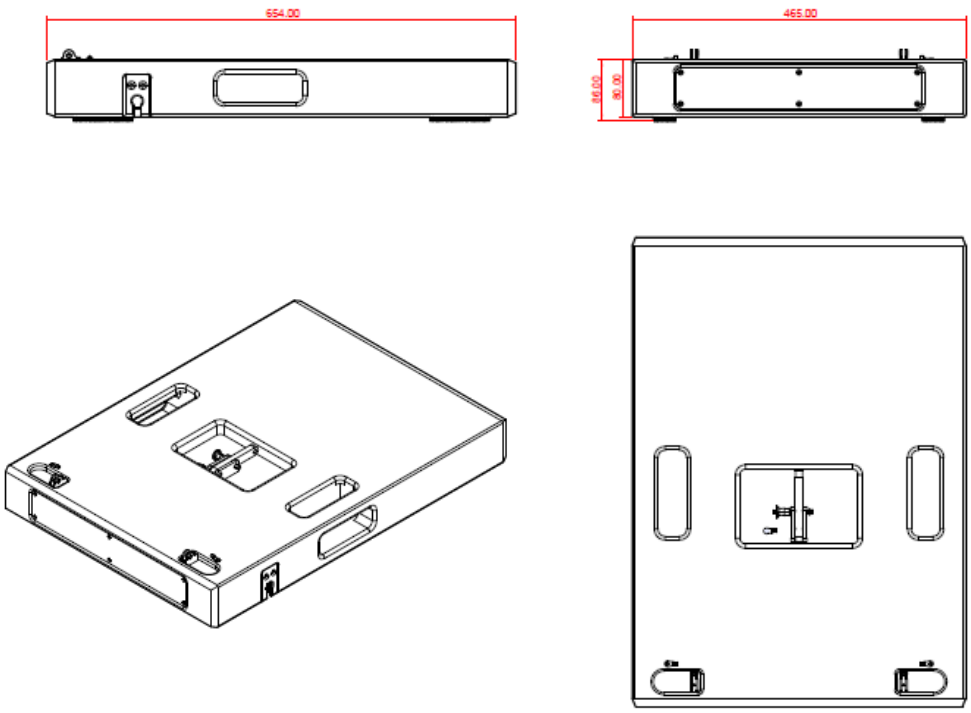


Figure 20. B 15 SFi L35 views and dimensions. Annotations given in millimeters.

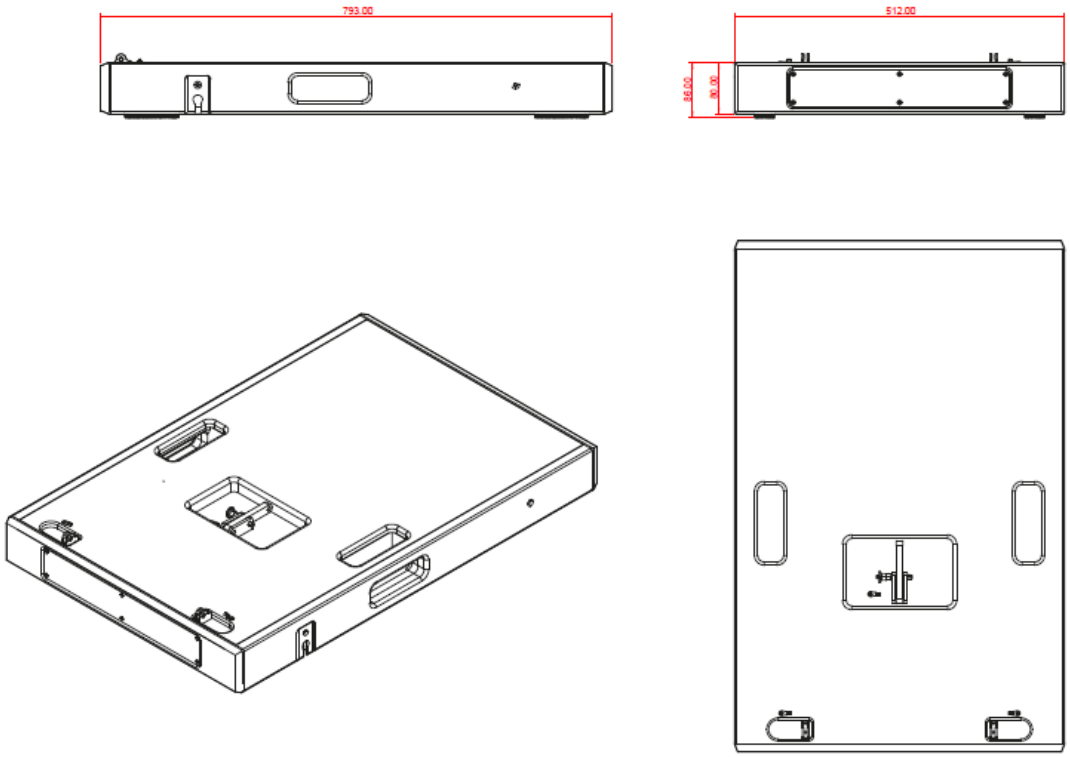


Figure 21. B 18 SFi L35 views and dimensions. Annotations given in millimeters.

Manufacturer's Declarations

WARRANTY

SE AUDIOTECHNIK gives a warranty of 4 years on SE AUDIOTECHNIK products. The warranty period begins with the purchasing date. The warranty applies to material or production defects that occur. Defective components or products will be repaired or replaced free of charge by SE AUDIOTECHNIK at its own sole and exclusive discretion during the warranty period.

EXTENDED WARRANTY

Customers who register their product with SE AUDIOTECHNIK within 180 days of the date of purchase are entitled to a free 2-year warranty extension. After this free registration period, SE AUDIOTECHNIK offers a chargeable warranty extension.

WARRANTY TRANSFER

The warranty given is non-transferable and refers to the original purchaser. In the event of a change of ownership, SE AUDIOTECHNIK offers the option of warranty coverage at a charge.

NOTE

SE AUDIOTECHNIK does not guarantee the uninterrupted and fault-free operation of the products.

The warranty does not apply:

- For wear parts and natural abrasion.
- For damage, defects or malfunctions caused by improper use or use for other than the intended purpose.
- For damage, defects and malfunctions caused by the use of force or environmental conditions.
- For unauthorized repair efforts.

REQUESTING WARRANTY SERVICES

The request for warranty service can be submitted to SE AUDIOTECHNIK or to the dealer from whom the SE AUDIOTECHNIK products were purchased.

Contact details SE AUDIOTECHNIK

SE AUDIOTECHNIK Head office

Neuenhofer Straße 42-44,

Solingen, 42657

Germany

Phone: +49 212 – 38226 – 0

E-Mail: info@se-audiotechnik.de

In order to claim warranty service, you must provide proof of purchase and allow SE AUDIOTECHNIK to examine the warranty claim (e.g. sending in the products, examination at an authorized partner). Without proof of purchase, the provision of a warranty service can be rejected. During the extended warranty period, proof of product registration must be provided in addition.

IMPORTANT NOTE

Your statutory warranty rights are not affected by this warranty. Furthermore, this warranty has no influence on any agreements you may have concluded with a dealer.

LIMITATION OF LIABILITIES

SE AUDIOTECHNIK is not liable for personal injury, material damage or claims resulting from inappropriate, dangerous or incorrect use of the products.

EU DECLARATION OF CONFORMITY

SE AUDIOTECHNIK devices comply with the fundamental requirements and other relevant specifications of the directives of the European Union. The detailed declaration and the list of these directives and harmonized standards are provided on the website https://se-audiotechnik.de/. Included are all product variants, as long as they comply with the original technical design and have not been subsequently modified mechanically, electrically or in their original condition.

CORRECT DISPOSAL OF PRODUCTS (ELECTRICAL WASTE)

(Applicable in the European Union and other European countries with separate waste collection systems).

SE AUDIOTECHNIK products must not be disposed of with other waste at the end of their service life to avoid possible harm to the environment or human health.

Private users can contact either the dealer from whom they purchased the products or the local authority for information on environmentally friendly disposal. Commercial users can contact their supplier, if they have any questions about disposal.

DECLARATION ON WEEE POLICY

SE AUDIOTECHNIK products are designed and manufactured with high quality materials and components that are intended to be recyclable and/or reusable.

SE AUDIOTECHNIK is WEEE registered in accordance with WEEE policy.

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