



GEO M6 Series

Geo M620 & Geo M6Bass Tangent Array Modules

 *User Manual*

GEO M6 Series User Manual V1.01
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GEO Technology is radically new thinking

The GEO R&D Project has, to date, resulted in the following patent applications:

The GEO Hyperboloid Reflective Wavesource™ differs radically from the megaphone-variant type horns you know and love (or hate). “Tried and true” methods will produce entirely unexpected results. HRW technology produces precise and predictable results.

The Configurable Directivity Flange. A waveguide that allows the operator to alter its behaviour. An unprecedented NEXO development that is easy to use – once you know how and when.

The Directivity Phase Device needs no operator input to function, but it is reassuring to know that the coupling of the midrange of the system is considered as important as the high frequencies...

DSP-driven Directional Sub-bass devices are a new approach to controlling LF/VLF acoustic energy.

GEO is not hard to use when you understand how...

The technology behind GEO is revolutionary, but it is grounded in years of practical experience with the problems of delivering high quality professional sound to large audiences at high SPL levels. The GEO toolbox includes NS-1 - a simple yet powerful and highly predictive design tool. The array assembly system is keyed to the design software and will easily enable you to deploy your design with great precision. The NXAMP Amplified Digital TDcontroller provides driver protection and system optimization as well as DSP-driven cardioid pattern control for the LS and RS series Subwoofers.

GEO is a high precision system

The GEO HRW™ controls acoustic energy more precisely than other multiple element waveguides. It also makes GEO less forgiving of mistakes. Whilst conventional horns never combine into a coherent array, they may deliver acceptable results even if the design and deployment of the system is less than optimal. This is not the case with GEO where careless installation produces catastrophic results.

A GEO Tangent Array is not a “line array”

GEO Technology is equally effective in designing and deploying tangent horizontal arrays or curved vertical arrays. For best results in a specific application the user needs to know how multi-speaker arrays interact with audience geometry, along with the benefits and drawbacks of curved vertical arrays and horizontal arrays.

Curved tangent arrays require different design techniques

For the past 20 years, sound reinforcement professionals have worked with horizontal arrays that use conventional horns to deliver [more or less] ‘equal power to equal *angles*’. Curved vertical arrays are designed to deliver [more or less] equal power to equal *areas*’. When arrays use conventional horns, the lack of precision, overlap and interference masks errors in array design and aiming. The highly precise GEO wavesource responds accurately, consistently and predictably to the design and deployment of a curved vertical tangent array. This is why the GEO rigging system is designed to control angular splay to 0.01° precision.

GEO curved tangent arrays require different operational techniques

Over the years, system designers and operators have developed a number of signal processing techniques to disguise and partly overcome the limitations of horn design. “Frequency shading,” “amplitude shading,” “system tuning,” all of these are tools of the advanced sound system operator. **NONE OF THESE TECHNIQUES ARE APPLICABLE TO GEO TANGENT ARRAYS.** Instead of enhancing the array’s performance they will severely degrade it.

Take time to learn how to get great results with GEO Technology. It is an investment that will pay off in more satisfied clients, more efficient operating procedures and more recognition for your skill as a sound system designer and operator. A comprehensive understanding of GEO theory, tangent arrays, and specific features of the GEO M6 Series will help you to operate your system at its full potential.

PLEASE READ CAREFULLY BEFORE PROCEEDING**BASIC PRECAUTIONS**

Do not open the speaker system or attempt to disassemble the internal parts or modify them in any way. The speaker system contains no user-serviceable parts. If it should appear to be malfunctioning or damaged, discontinue use immediately and have it inspected by qualified NEXO service personnel.

Water exposure: Do not expose the speaker system to direct rain, do not use it near water or in wet conditions. Do not place containers with liquid on speaker system as they might spill into openings. If any liquid such as water seeps into the speaker system, have it inspected by qualified NEXO personnel.

SYSTEM DEPLOYMENT SAFETY RULES

Read User Manual before deployment. Before use of enclosed speaker system, please ensure that anyone involved in system deployment understands the rigging – stacking – pole mounting safety rules as described in the speaker system User Manual. Failure to do this exposes people to potential injury or death.

Always consult qualified NEXO personnel if the device installation requires construction work and make sure to observe the following precautions:

Mounting precautions

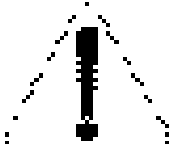
- choose mounting hardware and an installation location that can support the weight of the speaker system;
- do not use speaker system handles for suspended installation;
- do not expose speaker system to excessive dust or vibration, or extreme cold or heat to prevent possibility of component damage;
- do not place the speaker system in an unstable position from which it might fall accidentally;
- if speaker systems uses a stand, ensure that stand specifications are adapted, and that stand height does not exceed 1.40m/55"; never move the stand while the speaker is in position.

Connection and powering precautions

- remove all connected cables before moving the speaker system;
- turn off AC power of all power amplifier units before connecting the speaker system;
- when turning on the AC power to the audio system, always turn on the power amplifier last; when turning the AC power off, always turn off the power amplifier first;
- when used in cold conditions, a gradual power ramp up should applied to the system on an 5 mn period to allow the loudspeaker components to stabilize during the very first minutes of usage.

Inspect the speaker system periodically.


SAFETY INSTRUCTIONS FOR NEXO TD CONTROLLERS






NEXO ANALOGUE PSTDCONTROLLERS, NX242 DIGITAL CONTROLLER, NXAMP4x1 AND NXAMP4x4 POWERED CONTROLLERS ARE CLASS 1 APPARATUS AND MUST BE EARTHED.

THE GREEN AND YELLOW WIRE OF THE MAINS CORD MUST ALWAYS BE CONNECTED TO AN INSTALLATION SAFETY EARTH OR GROUND. THE EARTH IS ESSENTIAL FOR PERSONAL SAFETY AS WELL AS THE CORRECT OPERATION OF THE SYSTEM, AND IS INTERNALLY CONNECTED TO ALL EXPOSED METAL SURFACES.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. (US market)
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.




The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

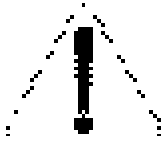
WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

To avoid electrical shock, do not remove covers. Dangerous voltages exist inside. Refer all servicing to qualified personnel only.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

HIGH SOUND PRESSURE LEVELS



Exposure to extremely high noise levels may cause permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient period of time. The U.S. Government's Occupational and Health Administration (OSHA) has specified the following permissible noise level exposures: Sound Duration Per

Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT



This symbol on the product or on its packaging indicates that it shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequence for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

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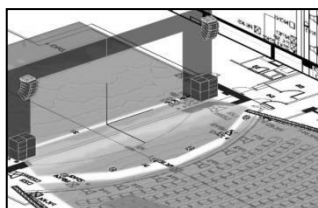
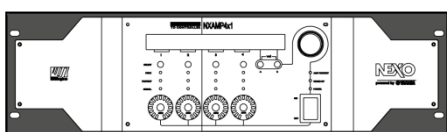
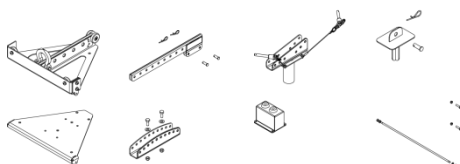
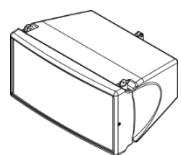
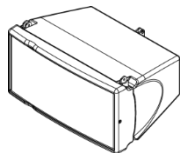
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1 INTRODUCTION

Thank you for selecting a NEXO GEO M6 Series Tangent Array System.

This manual is intended to provide you with necessary and useful information about your GEO M6 System, which includes the following products:



- GEO M620 is a 20° Tangent Array Module. It comprises 1x6.5" (17cm) 8 ohms LF/MF driver and 1x1.5" voice coil, 1" Throat 16 Ohm HF Driver loaded by a 15° Hyperboloid Reflective Wavesource™.
- GEO M6B is a Bass-Mid Reinforcement module for Geo M620. It comprises 1x6.5" (17cm) 8 ohms LF/MF driver™.
- GEO M6 Accessory Range. a full range of accessories that provides safe, flexible and simple means of installing Geo M6 as single or multiple units in fixed installation as well as in touring applications.
- GEO M6 modules are controlled, powered and monitored by NXAMP4x1. For a complete description of this controller, please refer to User Manual. NXAMP DSP algorithms and parameters are fixed in software and updated regularly: Please consult the NEXO web site (www.nexo-sa.com) for the latest software releases.
- NS-1 simulation software assists in the design and implementation of vertical tangent GEO arrays. Please consult the NEXO web site (www.nexo-sa.com) for the latest software releases.
- Available for iPad and iPhone, NEXO NeMo provides remote control over an NXAMP network from anywhere in the venue, thanks to an intuitive and graphically attractive user interface. NeMo is available on iTunes.

Please devote your time and attention to reading this manual. A comprehensive understanding of GEO theory, tangent arrays and specific features of GEO M6 will help you to operate your system at its full potential.

2 GEO M6 GENERAL SET-UP INSTRUCTIONS

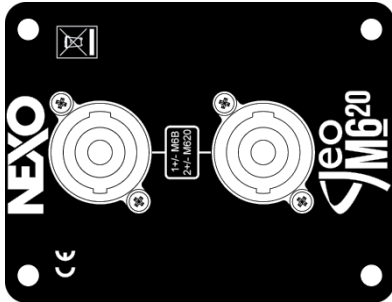
2.1 Speaker connection

GEO M620 and M6B are connected with Speakon NL4FC plugs (not supplied). The 4 pins of the 2 Speakon sockets identified in / out are connected in parallel within the enclosure.

Either connector can be used to connect to NXAMP or to link to an additional Geo M6 cabinet. Therefore, a single 4-conductor cable can connect two NXAMP channels to various Geo M620 and M6B.

2.1.1 GEO M620 connectors

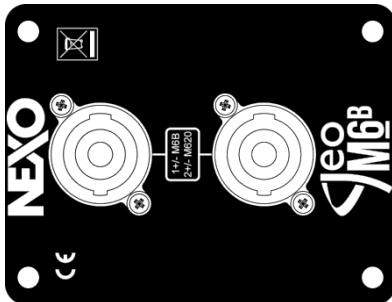
Connectors are wired as follows:



Speakon Connector		M620
1(-)	⇒	Through
1(+)	⇒	Through
2(-)	⇒	Geo M620 (-)
2(+)		Geo M620 (+)

2.1.2 GEO M6Bass connectors

Connectors are wired as follows:



Speakon Connector		M620
1(-)	⇒	Geo M6Bass (-)
1(+)	⇒	Geo M6Bass (+)
2(-)	⇒	Through
2(+)		Through

2.1.3 Cabling

IMPORTANT

Long speaker cables induce capacitive effects – up to hundreds of pF depending on the quality of the cable - with a low-pass effect on high frequencies. If long speaker cables must be used, ensure that they do not remain coiled while in use.

3 AMPLIFIER SELECTION FOR USE WITH GEO M6 & LS18

3.1 GEO M6 and NXAMP TDControllers

NEXO Powered TDControllers NXAMP 4X1 is an integrated solution for Control and amplification for all NEXO speaker ranges.

NXAMP4x1 power capability is listed in the table below:

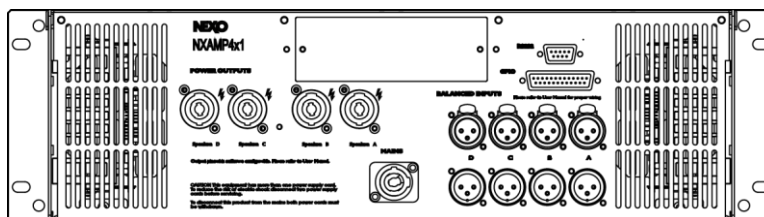
Mode	4 Channels	Bridge Stereo
NXAMP4x1	4 x 600 Watts / 8 Ohms	2 x 1800 Watts / 8 Ohms
	4 x 900 Watts / 4 Ohms	2 x 2600 Watts / 4 Ohms
	4 x 1300 Watts / 2 Ohms	

3.1.1 NXAMP connectors

NXAMP4x1 rear panels features:

- 4 analog inputs / outputs (links) on XLR3 connectors;
- 4 digital inputs / outputs on RJ45 connectors with a slot for optional NX-ES104 (Ethersound™) or NX-DT104 (Dante™) cards;
- 4 speaker level outputs on NL4FC connectors.

Figure below shows connectors implementation on the rear panel.



3.1.2 GEO M6 and NXAMP4x1 recommended loading

Passive Mode	
3 x GEO M620	1 channel of NXAMP4x1 in 4 channels mode
3 x GEO M6Bass	1 channel of NXAMP4x1 in 4 channels mode

4 GEO M6 SETUPS ON NEXO TD CONTROLLERS

4.1 NXAMP TDControllers

As of this manual printing date, load 3.22 features the setups listed in below table in the “NEXO configurations” menu.

NEXO recommended setups	CH1	CH2	CH3	CH4
'M620-LS18 120Hz' '1-3 Boxes'	LS18 (bridged with CH2)	N/A	M620	M620
'M620-LS18 120Hz' '4-12 Boxes'	LS18 (bridged with CH2)	N/A	M620	M620
'M620-70Hz' '4 Ch. 1-3 Boxes'	M620	M620	M620	M620
'M620-70Hz' '4 Ch. 4-12 Boxes'	M620	M620	M620	M620
'M620-120Hz' '4 Ch. 1-3 Boxes'	M620	M620	M620	M620
'M620-120Hz' '4 Ch. 4-12 Boxes'	M620	M620	M620	M620

- Setups “1-3 Boxes” are to be used in small configuration (pole stand, lip fill, under-balcony);
- Setups “4-12 Boxes” are to be used in larger arrays – typically flown;
- Frequency value is high-pass filter cut-off point.

Additionally, “Custom configurations menu” allows to build any combination of NEXO speakers – including GEO M6Bass with:

- Full phase compatibility from 20 Hz to 20kHz.
- Choice between 85 Hz and 120 Hz X-over point between Nexo LS or RS subwoofers and Geo M6.

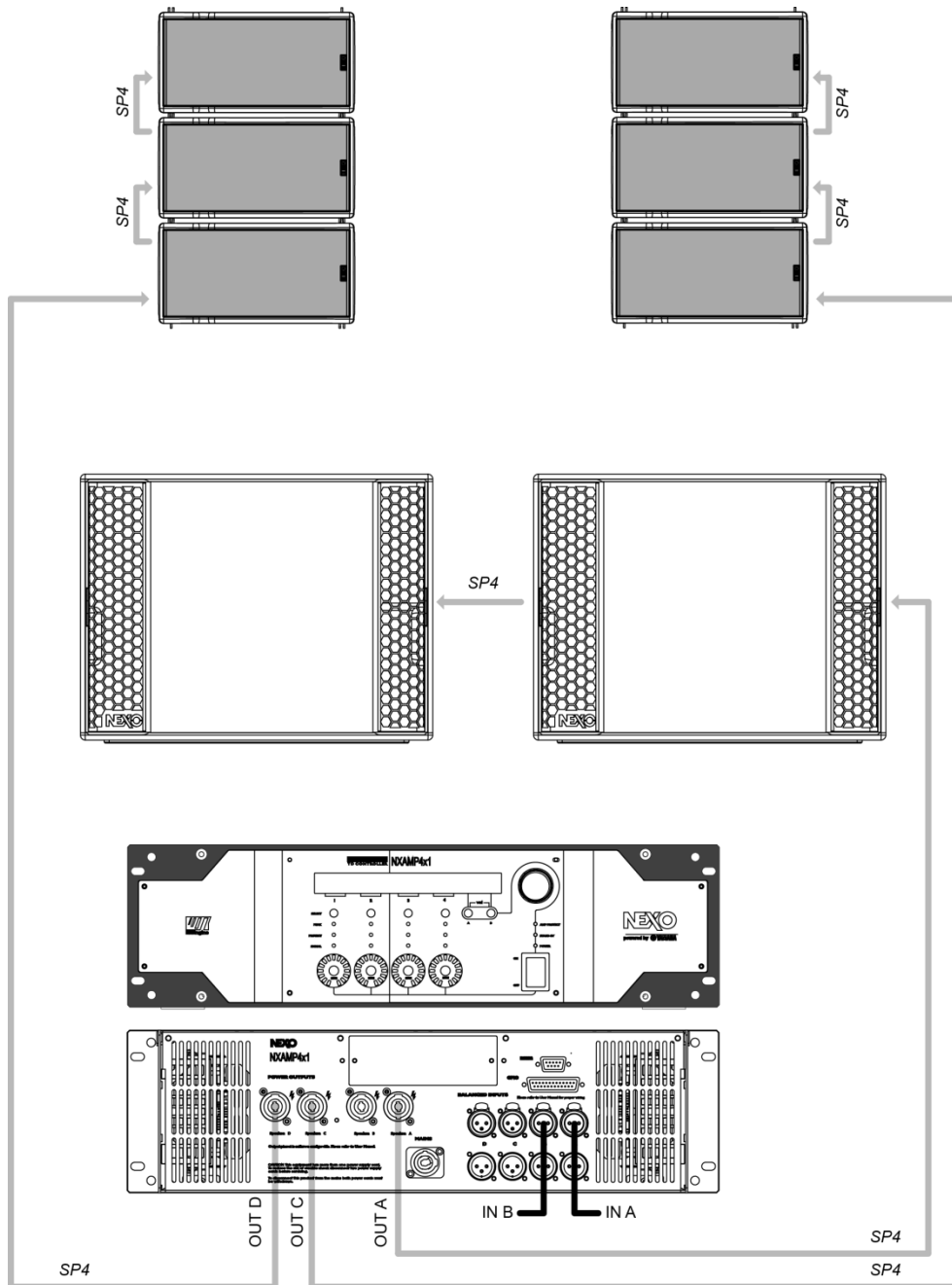
NEXO Custom setups
M620 4-12 BOXES 70Hz-20kHz
M620 4-12 BOXES 85Hz-20kHz
M620 4-12 BOXES 120Hz-20kHz
M620 1-3 BOXES 70Hz-20kHz
M620 1-3 BOXES 85Hz-20kHz
M620 1-3 BOXES 120Hz-20kHz
M6B 70Hz-180Hz
M6B 85Hz-180Hz

Please consult www.nexo-sa.com for upgrade releases.

5 CONNECTION DIAGRAMS

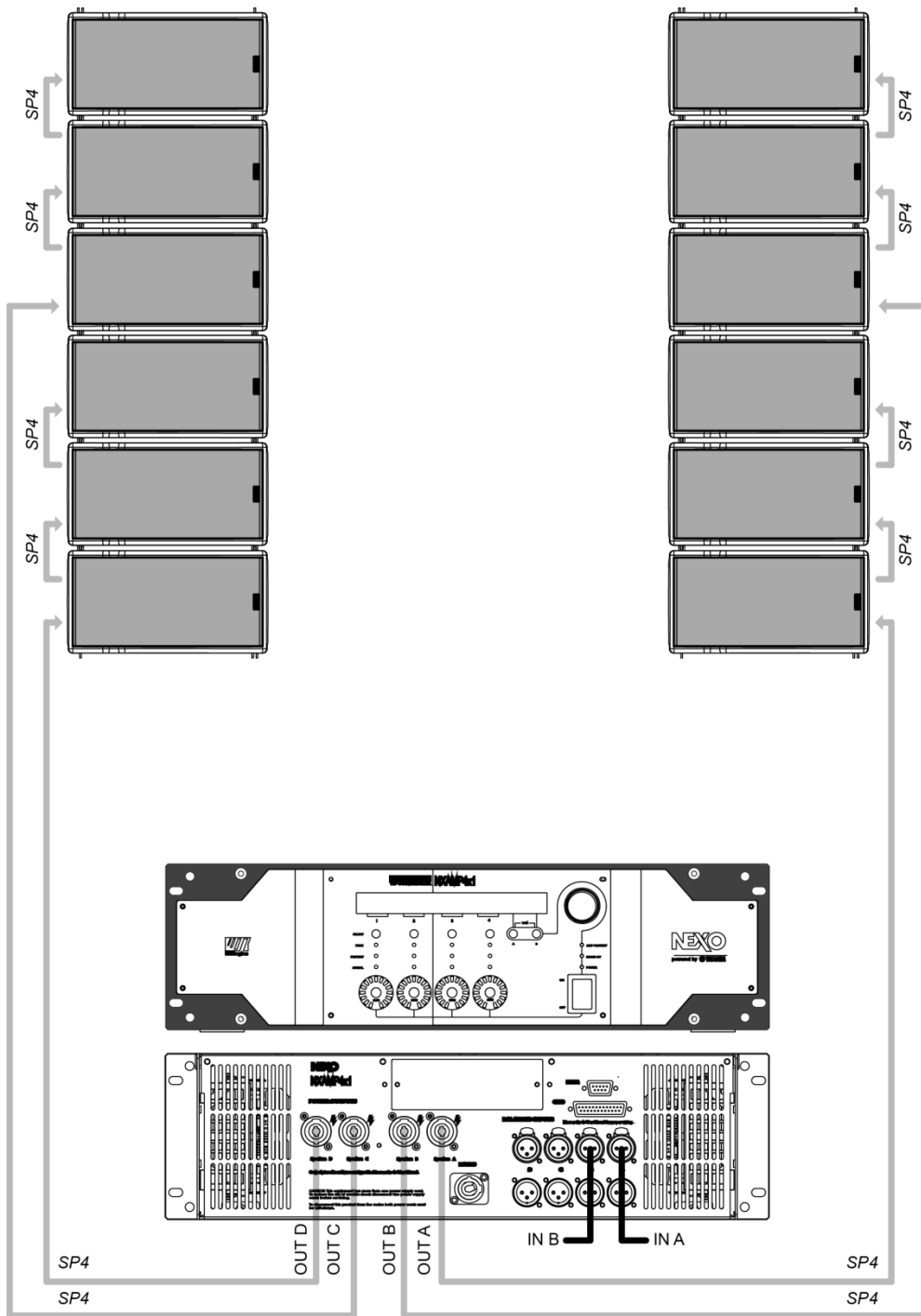
5.1 6 x GEO M620 stereo – 2 x LS18 mono on NXAMP4x1

Channels 1 & 2 are bridge mono for 2xLS18, channel 3 & 4 drive 3 GEO M620 each



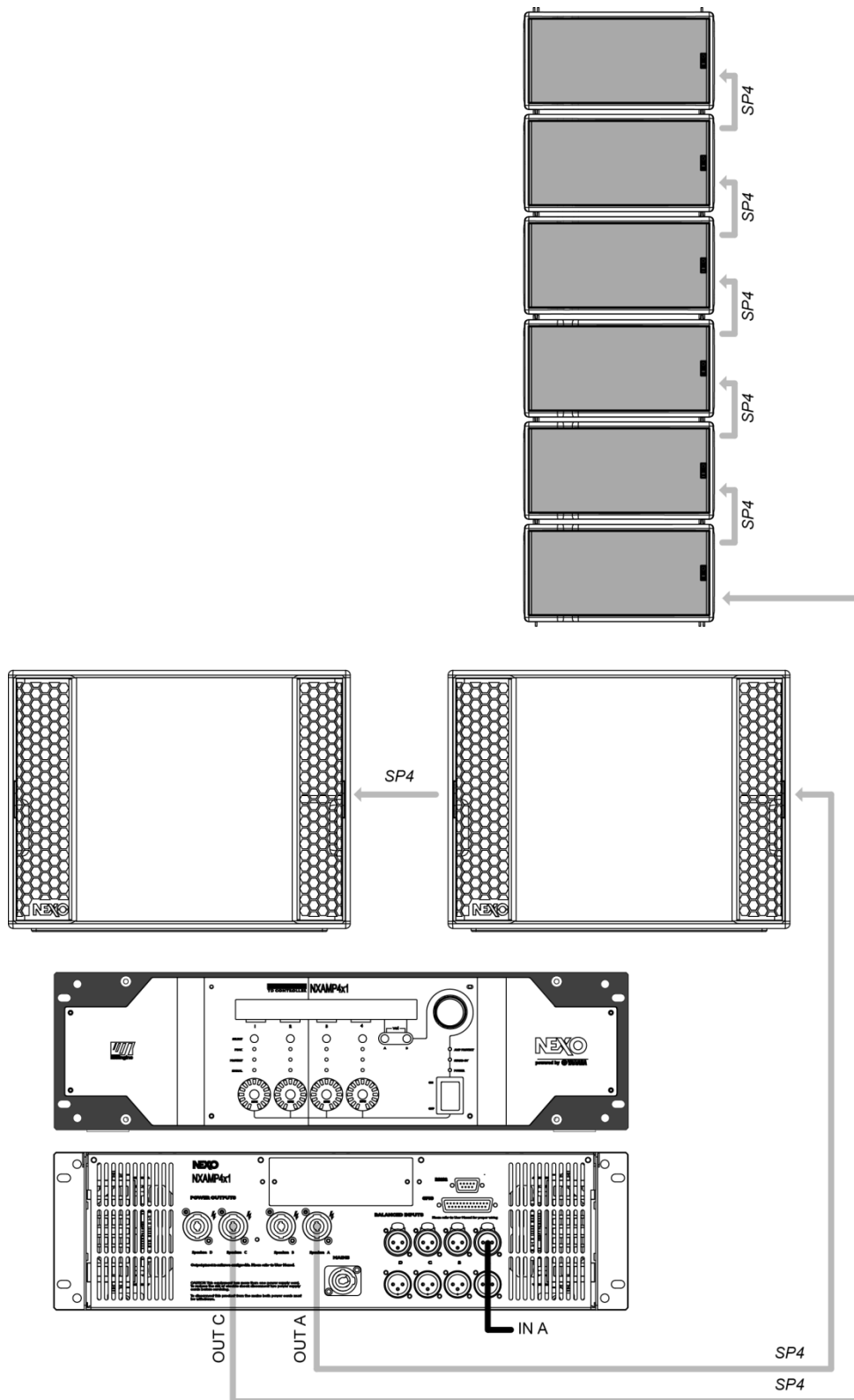
5.2 12 x GEO M620 on NXAMP4x1

Each NXAMP4x1 channel drives 3 GEO M620



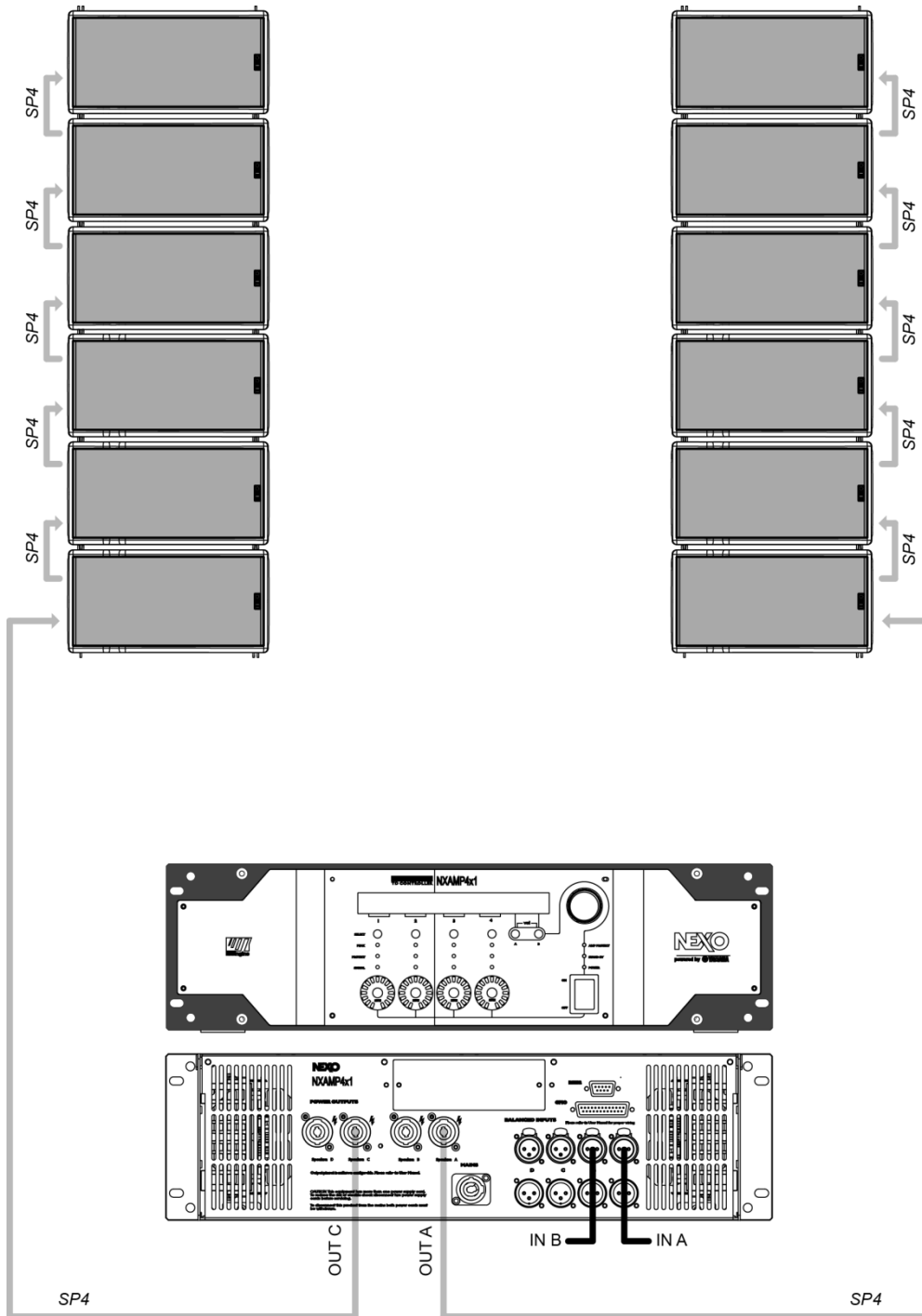
5.3 3 x GEO M620 stereo – 3 x GEO M6B stereo - 2 x LS18 mono on NXAMP4x1

Channels 1 & 2 are bridge mono for 2xLS18, channel 3 drives 3xGEO M6Bass, channel 4 drives 3x GEO M620.



5.4 6 x GEO M620 stereo – 6x GEO M6B stereo on NXAMP4x1

Channels 1 & 3 drive 3xGEO M6Bass each, channels 2&4 drive 3xGEO M620 each.



6 NS-1 SIMULATION SOFTWARE

NS-1 software is a R&D simulation tool derived application. It processes measured speaker data with complex mathematical algorithms to assist the user in optimizing system design. Due to the complexity of the interaction of multiple cabinets, it is simply not possible to reliably design curved vertical arrays without using the processing power of a computer to predict the optimum array structure for a given audience geometry. The design logic is far more complex than looking at a section drawing of the venue, measuring the overall angle needed to cover the audience from the cluster location, and dividing by 20 degrees to determine the required amount number of GEO M620 cabinets.

NS-1 is an easy to use tool that allows to shape the energy leaving the cluster to fit the audience. It predicts pressure levels radiated from the system to ensure enough cabinets are provided for the application, as well as mechanical constraints for safe flown systems.

In addition, it provides mechanical information for all clusters in agreement with Structural Analysis Reports (available in the Help section): dimensions, weight, gravity center position, forces, moments, working load and safety factor.

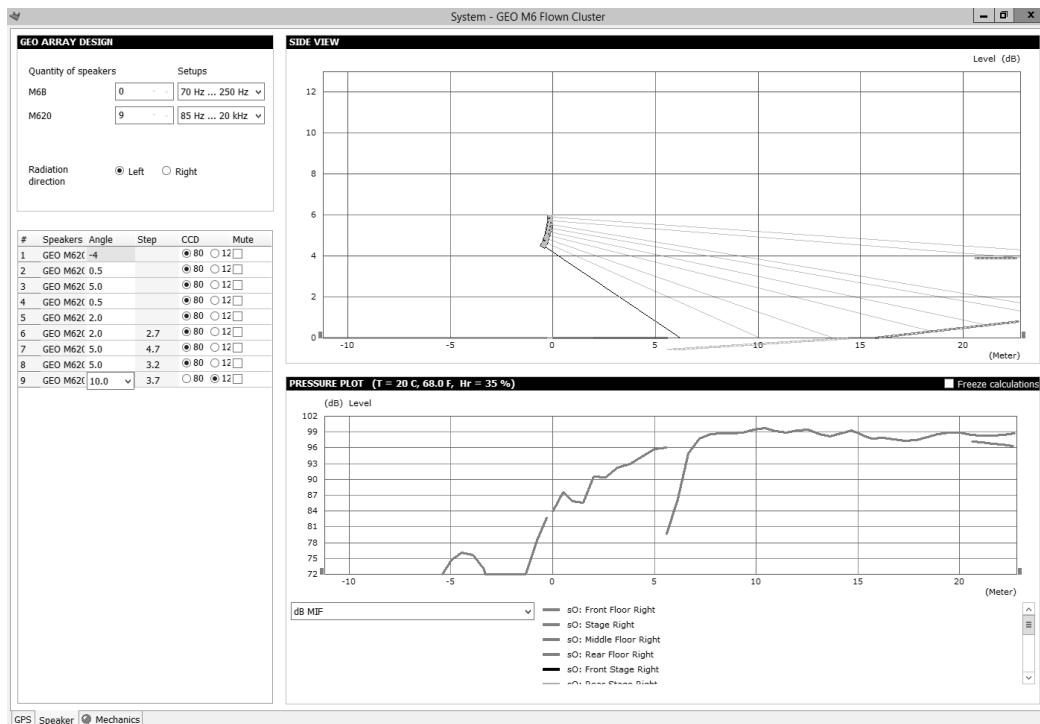
NS-1 installation package includes all NEXO User Manuals, Structural Analysis Reports and Certificates PDF files (which can be found in the last section of User Manuals).

NS-1 is a freeware available on www.nexo-sa.com

IMPORTANT

Never install a GEO M6 cluster without checking its acoustical performances and mechanical safety in NS-1 prior to installation.

Any question or bug report please contact technical@nexo.fr



7 CONFIGURABLE DIRECTIVITY DEVICE

The GEO Wavesource controls dispersion of acoustic energy using an hyperboloid acoustical reflector in the vertical plane and a diffraction slot in the horizontal plane. The patented Configurable Directivity Device consists of bolt-on flanges that alter the diffraction slot's exit flare rate thus increasing the horizontal coverage from 80° to 120°.

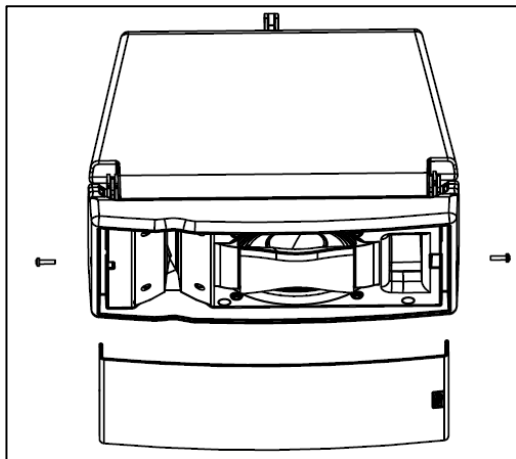
7.1 Installing & removing GEO's Configurable Directivity flanges

GEO M620 are shipped in the 80° dispersion configuration;

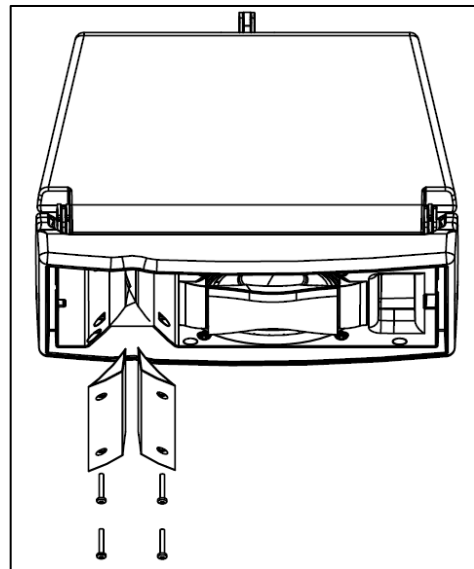
120° flanges is an optional accessory.

To change dispersion in the non-coupling plane to 120°:

- Remove the front grill (TORX15, drawings below);
- Remove the 2 TORX screws per flange on each side of the GEO Waveguide (drawings below);
- Install the 120° flanges with the 2 TORX screws
- Re-install the grid, being careful that the NEXO logo must be on the woofer side.



REMOVING THE GRILL

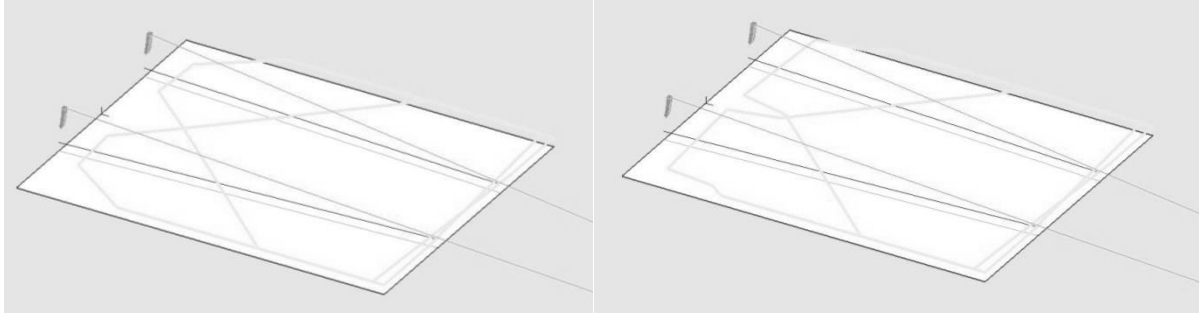


ADDING THE 120° FLANGES

7.2 When & where to use Configurable Directivity flanges

The diagrams show audience area coverage for a stereo system. While a GEO cluster will deliver even SPL from the front to the rear of this audience area, there are “holes” near the front in the centre and at the outside edges. We cannot fill the outside coverage gaps without enlarging the centre gap, and vice versa (left figure below).

If 120° Configurable Directivity Devices are installed at the bottom cabinet of the clusters, coverage will look more like the pattern in right figure below.



-6dB coverage, all GEO M620 in 80° configuration

-6dB coverage, bottom GEO M620 in 120° configuration

In curved vertical arrays, the 120° Configurable Directivity Device can be used:

- On the bottom row of curved vertical arrays, to fill in coverage gaps in the front rows.
- On all rows of curved vertical arrays, in cases where 120° of horizontal coverage is preferred to 80°.

8 GEO M6 HARDWARE SETUP PROCEDURE

Before proceeding with assembly of GEO M6 arrays, please ensure that the components are present and undamaged. A component list is appended to this manual. In the event of any shortage, please contact your supplier.

For maximum efficiency the GEO M6 rigging system requires three experienced persons for set-up: typically one motor hoist operator, and one operator per side of the array. Good synchronisation and crosscheck between the operators are key elements for a reliable and safe set-up.

8.1 SAFETY FIRST

GEO M6 Rigging System structural computations and related documents are available in NS-1 or at NEXO (info@nexo.fr) upon request.

We include this section to remind you of safe practice when flying the GEO M6 system. Please read it carefully. However, user must always apply his or her knowledge, experience and common sense. If in any doubt, seek advice from your supplier or NEXO agent.

This manual offers guidance only for GEO M6 loudspeaker systems. References in this manual to other rigging equipment such as motor hoists, steels, shackles etc. are made to clarify the description of rigging procedures. The user must ensure that operators are properly trained by other agencies in the use of these items.

The GEO M6 Rigging System has been optimised for the deployment of curved vertical or horizontal tangent arrays of GEO M6 loudspeakers. Angle adjustment between cabinets has been limited to specific settings to ensure correct acoustic coupling.

The GEO M6 Rigging System is a professional precision tool set, and should be handled with extreme care. Only persons who are fully conversant with the operation of the GEO M6 Rigging System and provided with suitable safety equipment should deploy GEO Arrays. Misuse of the GEO M6 Rigging System could lead to dangerous consequences.

Used and maintained correctly, the GEO M6 Rigging System will give many years of reliable service in portable systems. Please take the time to read and understand this manual. Always use NS-1 to determine the optimum angle settings for a particular venue, hang point and curved vertical GEO M6 cluster. Applied forces and moments are strongly cabinet quantity and angle configuration dependent. Cluster configuration must be implemented and validated in NS-1 prior to installation.

8.1.1 Flown Systems Safety

Always inspect all the rigging components and cabinets for damage before assembly. Pay special attention to the lifting points, and safety clips. If you suspect that any of the components are damaged or defective, DO NOT USE THE AFFECTED PARTS. Contact your supplier for replacements.

Read this manual carefully. Also be familiar with the manuals and safe working procedures for any ancillary equipment that will be used with the GEO M6 Rigging System.

Applied forces and moments are strongly cabinet quantity and angle configuration dependent. Cluster configuration must be implemented and validated in NS-1 prior to installation.

Ensure that all local and National regulations regarding the safety and operation of flying equipment are understood and adhered to. Information on these regulations can usually be obtained from Local Government Offices.

When deploying a GEO M6 system always wear protective headwear, footwear and eye protection.

Do not allow inexperienced persons to handle a GEO M6 system. Installation personnel should be trained in loudspeaker flying techniques and should be fully conversant with this manual.

Ensure that motor hoists, hoist control systems and ancillary rigging components are currently certified as safe and that they pass a visual inspection prior to use.

Ensure that public and personnel are not allowed to pass beneath the system during the installation process. The work area should be isolated from public access.

Never leave the system unattended during the installation process.

Do not place any object, no matter how small or light, on top of the system during the installation procedure. The object may fall when the system is flown and is likely to cause injury.

Secondary safety steels must be installed once the system has been flown to the operating height. Secondary steels must be fitted irrespective of requirements of the local safety standards applicable to the territory.

Ensure that the system is secure and prevented from pivoting around the motor hoist.

Avoid any form of excessive dynamic loading to the assembly (structural computations on GEO M6 Rigging System are based on a 1/1.2 factor for hoist or motor acceleration).

NEVER attach any item to the GEO M6 system other than the GEO M6 accessories.

When flying outdoor systems, ensure that the system is not exposed to excessive wind or snow loads and is protected from rainfall.

If wind velocity reaches or exceeds Beaufort 7 (60 km/h – 38 mp/h), the system must be landed.

The GEO M6 Rigging System requires regular inspection and testing by a competent test centre. NEXO recommend that the system is load tested and certified annually or more frequently if local regulations require.

When de-rigging the system ensure that the same duty of care is given to the procedure as for the installation. Pack GEO M6 components carefully to prevent damage in transit.

8.1.2 Ground Stacking Safety

Statistically, many more injuries occur due to unstable ground stacked PA systems than those associated with flown systems. There are several reasons for this fact, however the message is clear:

Always survey the supporting structure upon which a ground stack is to be built. Always look beneath PA wings to inspect the deck support and if necessary ask for the stage scrims and dressings be removed to allow access.

If the stage surface slopes, as it does in some theatres, ensure that the system is prevented from sliding forwards due to vibration. This may require the fitting of timber battens to the stage floor.

For outdoor systems ensure that that the system is protected from wind forces which might cause the ground stack to become unstable. Wind forces can be huge, especially upon large systems, and should never be underestimated. Observe meteorological forecasts, calculate the “worst case” effect upon the system prior to erection and ensure that the system is secured appropriately.

Take care when stacking cabinets. Always employ safe lifting procedures and never attempt to build stacks without sufficient personnel and equipment.

Never allow anyone, whether operators, artists or members of the public to climb onto a ground stacked PA system. Anyone who needs to climb over 2m (6 ft) high should be fitted with suitable safety equipment including a clip-on harness. Please refer to local Health and Safety legislation in your territory. Your dealer can help with advice on access to this information.

Apply the same attention to all safety matters when de-stacking systems.

Be aware that safety procedures are as important in the truck and in the warehouse as they are at the venue.

8.1.3 Contacts

Correct training is fundamental to safe practise when working with loudspeakers flying systems. NEXO recommend that users contact local industry associations for information on specialist course.

Information for International training agencies can be obtained by contacting either:

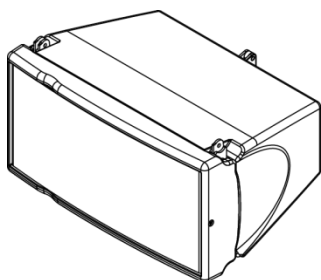
The Production Services Association
(PSA),
School Passage,
Kingston-upon-Thames,
KT1 SDU Surrey,
ENGLAND
Telephone: +44 (0) 181 392 0180

Rigstar Training and Testing Center
82 Industrial Dr. Unit 4
Northampton, Massachusetts
01060 U.S.A.
Phone: 413-585-9869 -- Fax: 413-585-
9872
school@rigstar.com

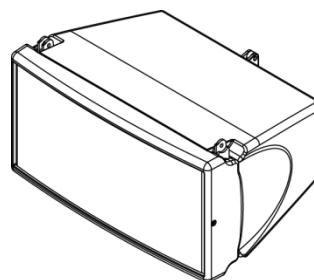
ESTA
Entertainment Services & Technology Association
875 Sixth Avenue, Suite 1005
NEW YORK, NY 10001 USA
Phone: 212-244-1505 – Fax: 212-244-1502
info@esta.org - www.esta.org

8.2 General Description

8.2.1 GEO M6 modules rigging system



GEO M620



GEO M620Bass

GEO M6BASS and GEO M620 feature a 3 point rigging system, 2 for front connection, and 1 for rear connection and angle splay settings.

Angle splay setting sequence is: 0.5° - 2° - 5° - 10° - 15° - 20°

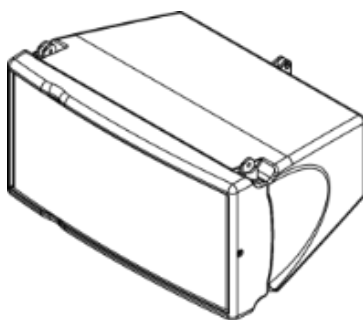
Below drawings show rear connecting bar configuration according to “left” or “right” configuration.

8.2.2 GEO M6 “Left” and “Right” configuration

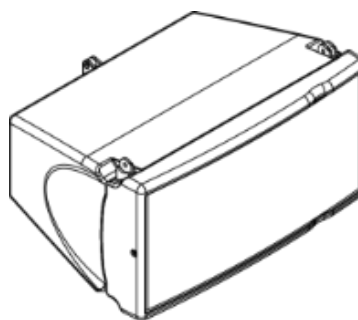
GEO M6 can be installed “Left” or “Right” :

- “Left” means HF waveguide is left as seen from front
- “Right” means HF waveguide is right as seen from front.

GEO M6 can be connected to bumpers “Left” or “Right” by simply flipping the cabinets. Whenever possible, NEXO recommends symmetrical designs (preferably NEXO logo outwards and HF waveguide inwards in stereo configurations)



GEO M620 “Left”

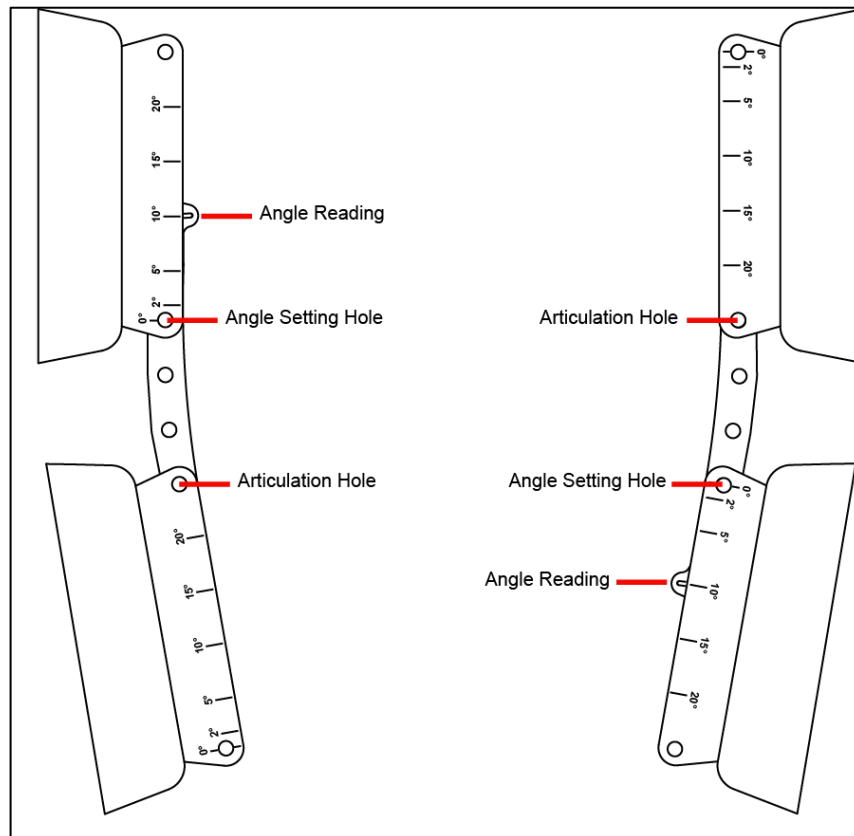


Geo M620 “Right”

8.2.3 GEO M6 Angle Setting Bar configuration

GEO M6 angle setting bar connects 2 x GEO M6 with 2 x VXT-BL515. It can be set upwards or downwards or removed on user's choice (independently from "Left" and "Right" configuration):

- If the angle settings bars are set downwards, it will have to be removed from cluster bottom cabinet
- If angle setting bars are set upwards, it will have to be removed when attached to GMT-LBUMP

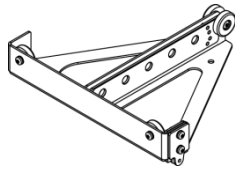


In order to avoid misuse or wrong angle setting by confusing left and right printings on GEO M6, remember that:

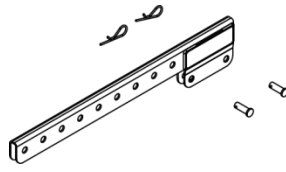
- The cabinet articulation hole around which angle setting bar rotates is always the one with no angle value indication
- The cabinet angle setting hole along which angle setting bar slides is always next to the "0°" indication
- The angle reading values are defined by the printing on the same side.

8.2.4 Accessories and kits

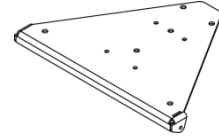
Geo M6 accessories are:



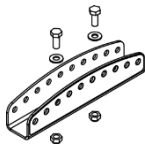
GMT-BUMPER
(up to 12xGeo M6 max)



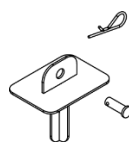
GMT-EXBAR



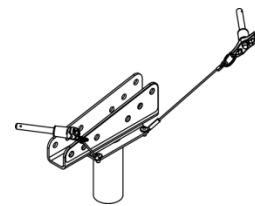
GMT-LBUMP
(up to 3xGeo M6 max)



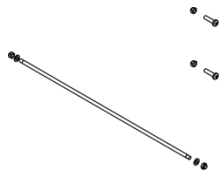
GMT-LBPADPT



GMT-BPADPT



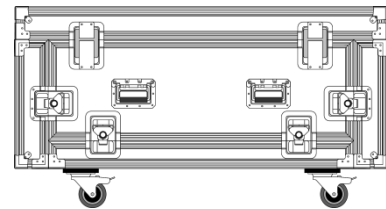
VNT-POLE



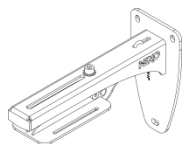
GMI-BNFIK



GMI-IPCOV



GMT-6CASE



VNI-WS15



VNT-TCBRK

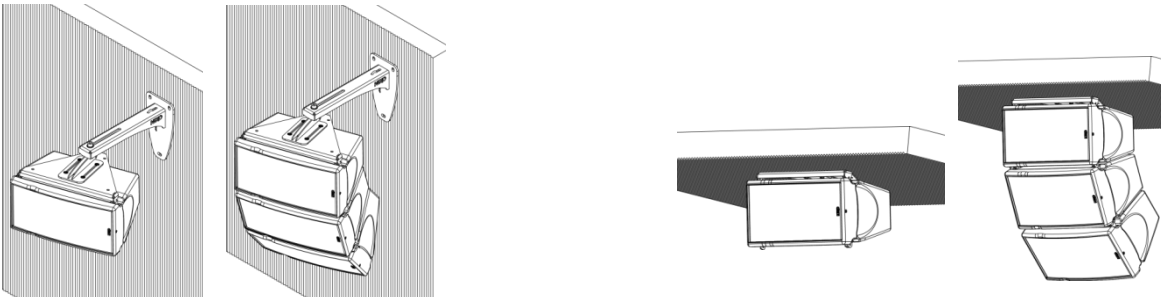


VNT-XHBRK

Please refer to sections 11 and 12 of this manual for more information on above references

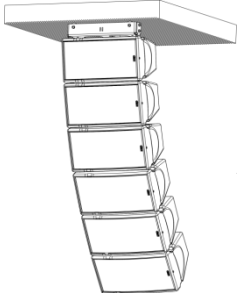
8.2.5 Described configurations

FIX INSTALLATION APPLICATIONS



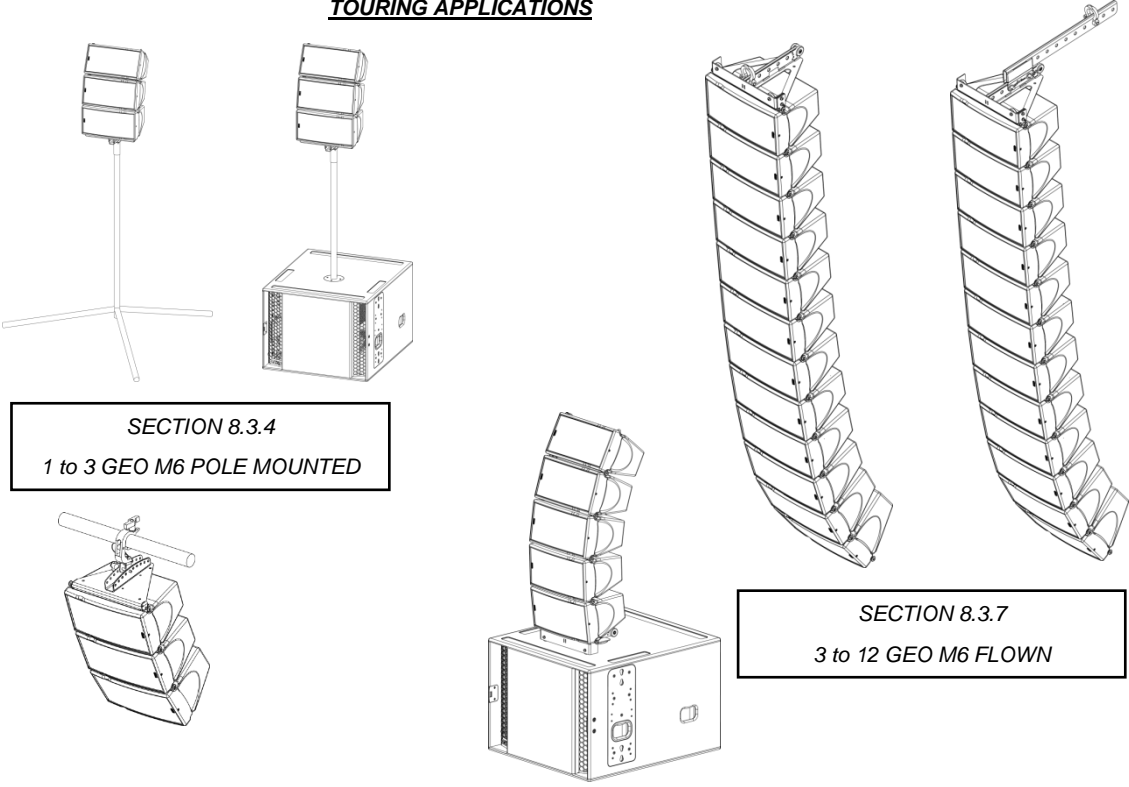
SECTION 8.3.1
1 to 3 GEO M6 WALL MOUNTED

SECTION 8.3.2
1 to 3 GEO M6 CEILING MOUNTED



SECTION 8.3.3
4 to 12 GEO M6 CEILING MOUNTED

TOURING APPLICATIONS



SECTION 8.3.4
1 to 3 GEO M6 POLE MOUNTED

SECTION 8.3.5
1 to 3 GEO M6 TRUSS MOUNTED

SECTION 8.3.6
1 to 6 GEO M6 STACKED ON SUB

SECTION 8.3.7
3 to 12 GEO M6 FLOWN

8.2.6 WARNINGS ON GEO M6 ACCESSORIES

WARNING 1

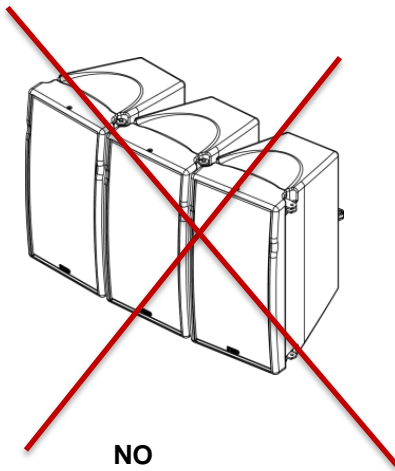
All GEO M6 Accessories are specifically rated in agreement with structural computations.

Never use other accessories – including push-pins - when assembling GEO M6 cabinets than the ones provided by NEXO: NEXO will decline responsibility over the entire GEO M6 accessory range if any component is purchased from different supplier.



WARNING 3

All GEO M6 accessories have been designed so that cabinets are arrayed vertically. GEO M6 horizontal assemblies as shown in figure below- are UNSAFE and STRICTLY PROHIBITED.



8.3 Installing GEO M6

IMPORTANT

In order to prevent screws from getting loose in fixed installations, use blocking liquid LOCTITE™ 243 or equivalent for all screws used with GEO M6 fixed installation accessories.

LOCTITE™ 243 is available at NEXO or at your local distributor upon request.

8.3.1 1 to 3 (maximum) GEO M6 wall mounted

Required items

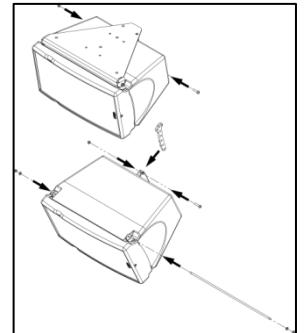
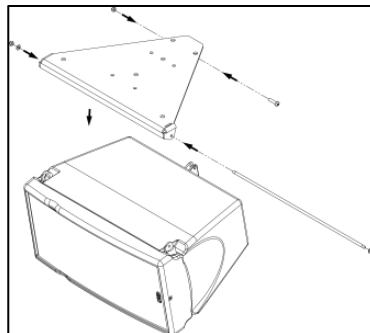
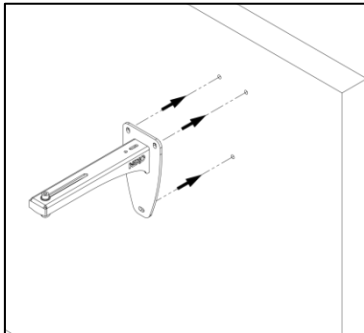
- 1 x VNI-WS15
- 1 x GMT-LBUMP
- 1 to 3 GMT-BNFIK
- 3 x 12mm diameter screws (not provided)

IMPORTANT

Ensure that the wall is strong enough to hold GEO M6 cluster weight and that the 12 mm diameter screws and corresponding plugs required to fix the VNI-WS15 on the wall are properly dimensioned.

Procedure

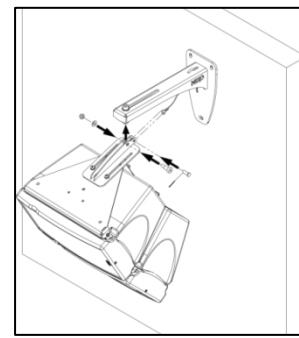
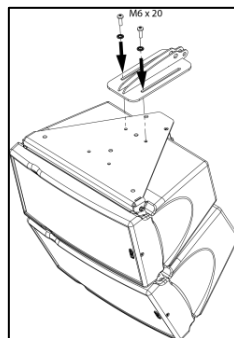
- 3 x 12mm diameter screws (not provided) are required to fix the VNI-WS15 support to the wall;
- Connect GMT-LBUMP to top cabinet by inserting the GMT-BNFIK axis through front holes and secure axis and rear link with GMT-BNFIK screws;
- Connect subsequent cabinets with appropriate inter-angle values;



- Connect the VNI-WS15 suspension plate to the GMT-LBUMP by using the M6x20 screws provided with the GMT-LBUMP

NB: please do not use the screws supplied with VNI-WS15, too long for this application case

- Position the 6x20 screws in the oblong hole so that required vertical angle is obtained
- Secure the screws with Loctite 243 or equivalent
- Suspend to the wall suspension using the shoulder screws supplied with VNI-WS15
- Secure the assembly with the VNI-WS15 safety cable
- Adjust horizontal angle



8.3.2 1 to 3 (maximum) Geo M6 ceiling mounted

Required items

- 1 x GMT-LBUMP
- 1 to 3 x GMT-BNFIX
- 4 x 8mm diameter screws (not provided)

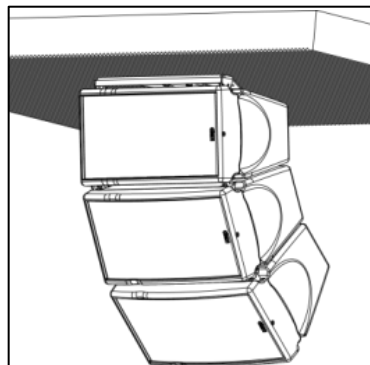
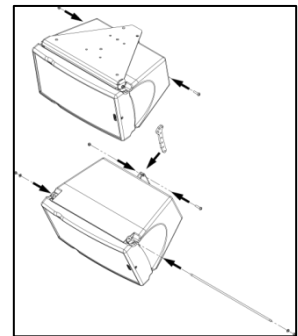
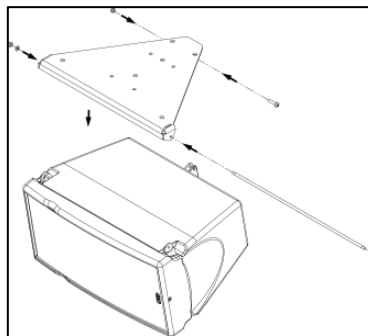
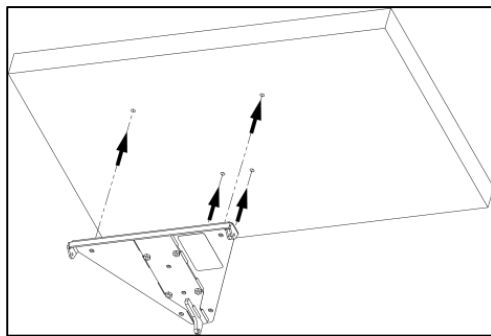
IMPORTANT

Ensure that the ceiling is strong enough to hold GEO M6 cluster weight and that the four screws 8 mm diameter and corresponding plugs required to fix the GMT-LBUMP under the ceiling are properly dimensioned.

Procedure

- 4 x 8mm diameter screws (not provided) are required to fix the GMT-LBUMP to the ceiling;
- Connect GMT-LBUMP to top cabinet by inserting the GMT-BNFIX axis through front holes and secure axis and rear link with GMT-BNFIX screws;
- Connect subsequent cabinets with GMT-BNFIX at required inter-angle values;

NB: please note that top cabinet angle will be -10° in relation to the L-bumper



8.3.3 4 to 12 (maximum) GEO M6 ceiling mounted

Required items

- 1 x GMT-BUMPER
- 4 to 12 x GMT-BNFIX
- 4 x 8mm diameter screws (not provided)

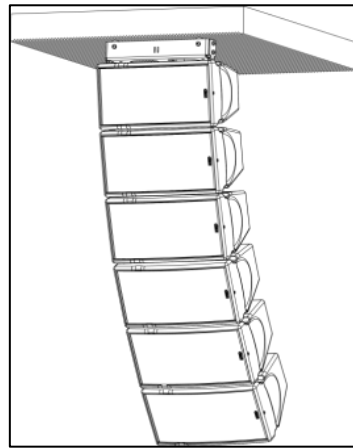
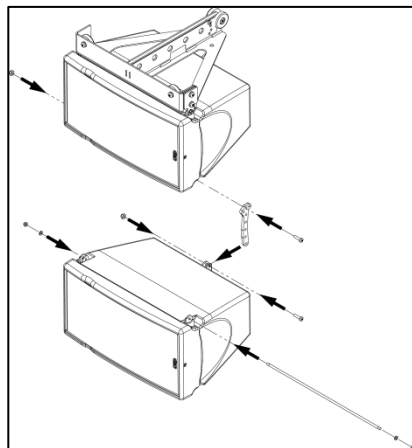
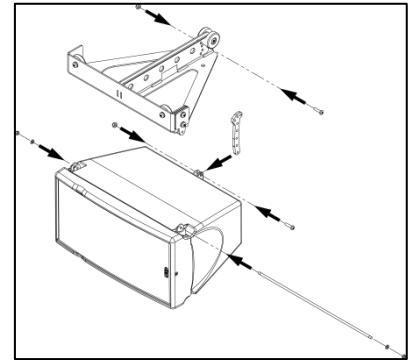
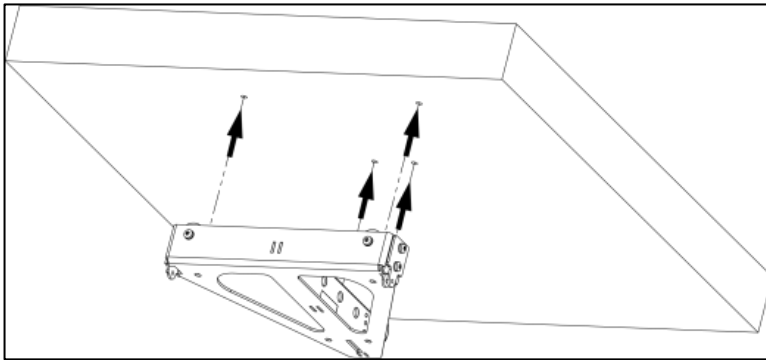
IMPORTANT

Ensure that the ceiling is strong enough to hold GEO M6 cluster weight and that the four screws 8 mm diameter and corresponding plugs required to fix the bumper under the ceiling are properly dimensioned.

Procedure

- 8mm diameter screws (not provided) are required to fix the GMT-BUMPER to the ceiling;
- Connect the bumper to top cabinet by inserting the GMT-BNFIX axis through front holes and secure axis and rear link with GMT-BNFIX screws;
- Connect subsequent cabinets with GMT-BNFIX at required inter-angle values;

NB: please note that top cabinet angle will be 0° in relation to the bumper



8.3.4 1 to 3 (maximum) GEO M6 pole mounted

Required items

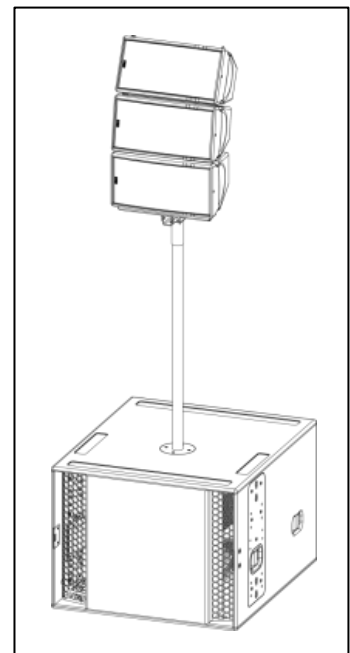
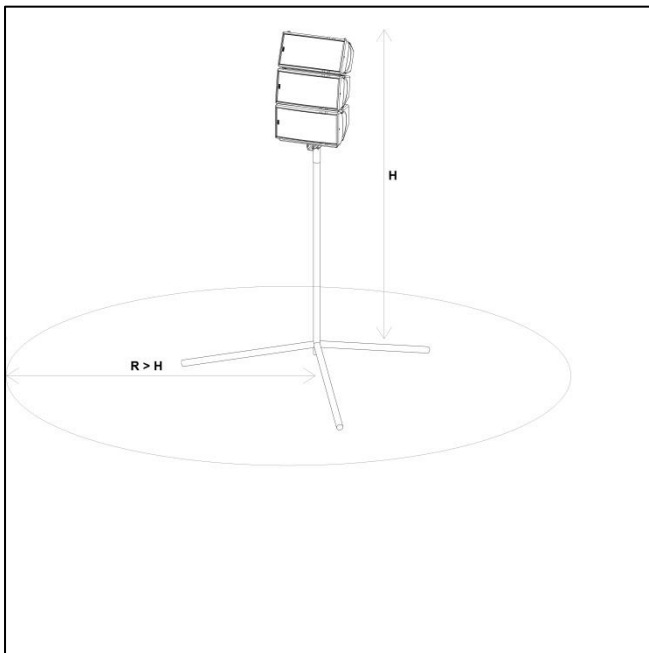
- 1 VXT-PLSTD or 1 Speaker Stand 35mm diameter
- 1 x GMT-LBUMP
- 1 x GMT-LBADPT
- 1 x VNT-POLE
- 3 x VXT-BL515 for first GEO M6
- 4 x VXT-BL515 for second and third GEO M6

IMPORTANT (SPEAKER STAND)

- Speaker stand must be rated for assembly weight (30kg rated load min);
- Speaker stand must always be installed on a horizontal surface;
- Stand height and footprint must be defined to prevent assembly from collapsing;
- Ensure that public is not allowed within a safety area which radius is equal or higher than assembly height.

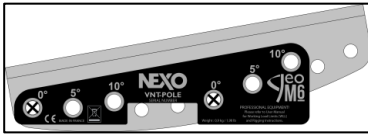
IMPORTANT (NEXO SUB POLE STAND)

- NEXO VXT-PLSTD pole stand only should be used for mounting on top of NEXO SUB
- NEXO SUB must always be installed on a horizontal surface;
- Ensure that public is not allowed within a safety area which radius is equal or higher than assembly height.

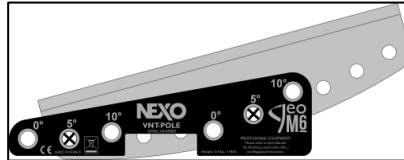


Procedure

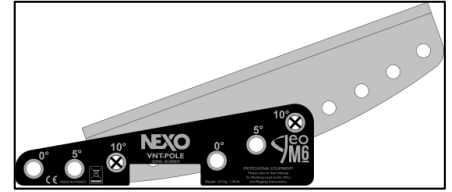
- Attach the GMT-LBADPT to the GMT-LBUMPER by using the screws, washers and bolts provided with GMT-LBADPT;
- Use the 2 pins provided with VNT-POLE to attach L-BUMP at required vertical angle, according to below drawings;



Bottom Geo M6 at 0°



Bottom Geo M6 at -5°

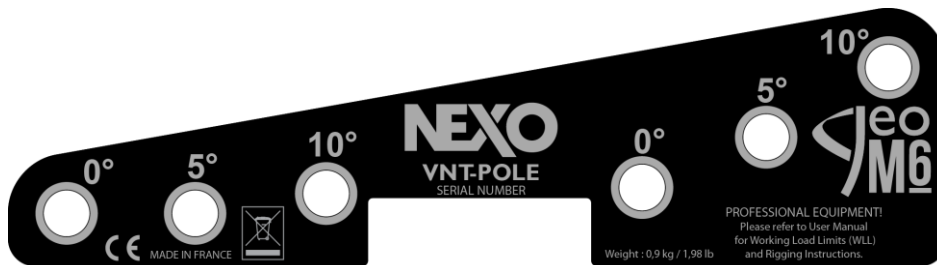


Bottom Geo M6 at -10°

NB: above connection configurations are designed for assembly gravity center being aligned with pole axis, ensuring maximum safety.

IMPORTANT

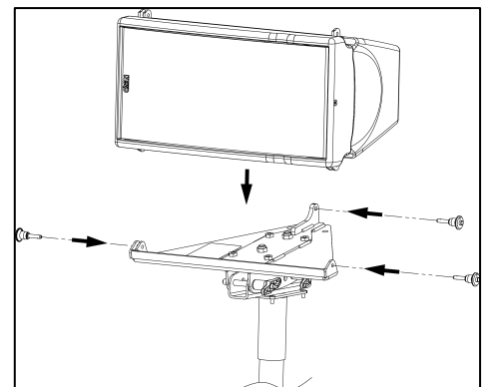
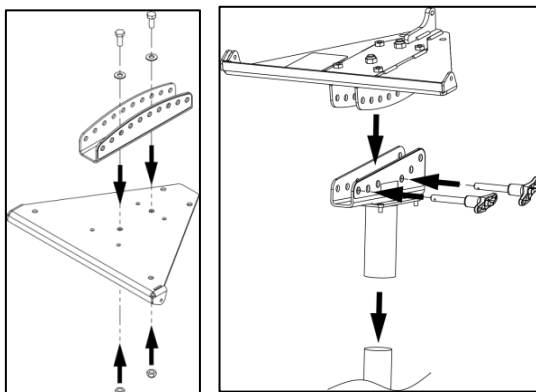
Ensure that 8mm pins are properly locked in VNT-POLE



- Connect bottom cabinet to GMT-LBUMPER with 3 x VXT-BL515 quick release pins
- Lift assembly on speaker stand or on LS18 with VXT-PLSTD pole stand.
- Connect subsequent cabinets at required inter-angle values with 4 x VXT-BL515 quick release pins

IMPORTANT

Ensure that pins are properly locked into Geo M6



8.3.5 1 to 3 GEO (maximum) M6 truss or cable mounted

Required items

- 1 x GMT-LBUMP
- 1 x GMT-LBADPT
- 1 x VNT-TCBRK (truss mounting) or 1 x VNT-XHBRK (cable mounting)
- 3 x VXT-BL515 for first GEO M6
- 4 x VXT-BL515 for second and third GEO M6

IMPORTANT

Ensure that suspension point is strong enough to hold GEO M6 cluster weight (35 kg)

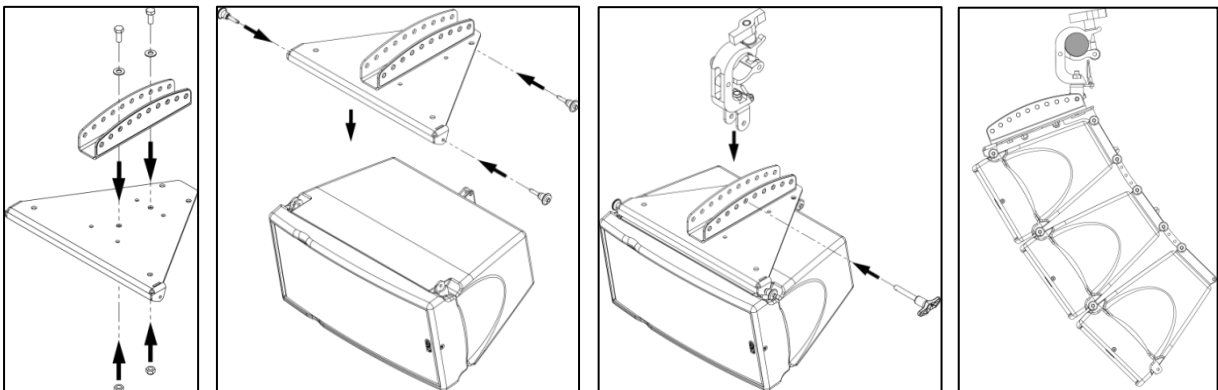
Procedure

- Attach the GMT-LBADPT to the GMT-LBUMPER by using the screws, washers and bolts provided with GMT-LBADPT;
- Connect top cabinet to GMT-LBUMP with 3 x VXT-BL515 quick release pins
- Connect subsequent cabinets at required inter-angle values with 4 x VXT-BL515 quick release pins
- Connect truss clamp VNT-TCBRK or ring clamp VNT-XHBRK to GMT-LBADPT by inserting 8x45 quick release pin in required holes for proper vertical aiming

IMPORTANT

Ensure that the 8mm pin is properly locked in GMT-LBADPT, and that 5mm pins are properly locked into GEO M6

- Lift and position assembly, lock and secure clamp on rigging point.



8.3.6 1 to 6 (maximum) GEO M6 stacked on Sub

Required items

- 1 x GMT-BUMPER
- 1 x GMT-BPADPT
- 4 VXT-BL515 per GEO M6

IMPORTANT

GMT-BPADPT is rated for a maximum of: 6xGEO M6s on a single LS18 in any inter cabinet angle configuration, provided the stack is assembled according to below rules:

- **LS18 must always be installed on a horizontal surface;**
- **Ensure that public is not allowed within a safety area which radius is equal or higher than assembly height.**
- **It is highly recommended to secure the system to a fix point located at the back of the stack.**

Procedure

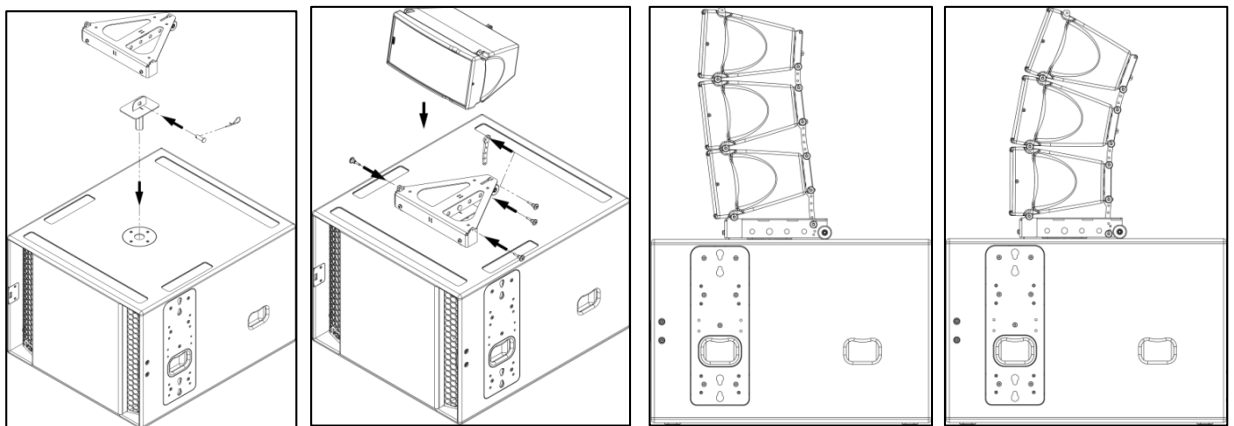
- Connect GMT-BPADPT poles stand adaptor to GMT BUMPER using provided clevis pin; secure pin with "R" clip
- Stack GMT-BUMPER on top of LS18 by inserting GMT-BPADPT into LS18 pole mount hole
- Connect bottom cabinet to GMT-BUMPER at required vertical angle with 4 x VXT-BL515 quick release pins

NB: please note that bottom cabinet angle can be adjusted from -7° to 0° in relation to LS18

- Connect subsequent cabinets at required inter-angle values with 4 x VXT-BL515 quick release pins

IMPORTANT

Ensure that the clevis pin is properly locked in GMT-BPADPT, and that 5mm pins are properly locked into GEO M6



8.3.7 4 to 12 (maximum) GEO M6 flown

Required items

- 1 or 2 hoists (not provided).
- 1 x GMT-BUMPER
- 1 x GMT-EXBAR for extended positive and negative bumper angles
- 4 VXT-BL515 per GEO M6
- 1 x GMT-6CASE for 6 x GEO M6

IMPORTANT

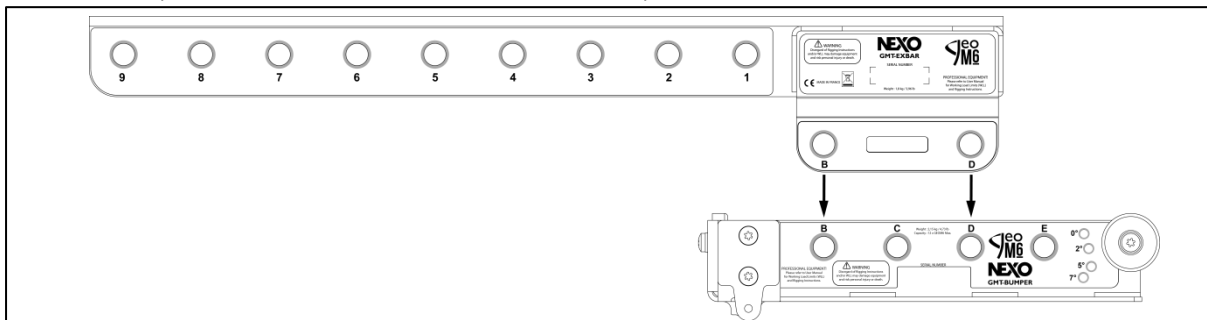
Maximum GEO M6 quantity for flown vertical cluster is 12 (and eventually less). Please check NS1 for mechanical Safety Working Load and acoustic computations.

IMPORTANT

Motor hoist must be rated to support entire cluster weight. Please check configuration in NS1 for proper motor hoist rating

Procedure with flight case set vertically

- Tip the flight case vertically
- Remove upper cover to access to top cabinet rigging points
- Connect GMT-BUMPER to top cabinet 4 x VXT-BL515 quick release pins
- If required, connect GMT-EXBAR to GMT-BUMPER by inserting EXBAR clevis pins into GMT-BUMPER "B" and "D" holes
- Connect single hoist to required hole as indicated in NS1 design
 - o "A", "B", "C", "D" or "E" on GMT-BUMPER
 - o Or "1" to "9" if using GMT-EXBAR
 - o If using 2 hoists, connect these using extreme points ("A" and "E", or "A" and "9" or "9" and "E")



GMT-BUMPER and GMT-EXBAR referenced rigging points

IMPORTANT

Ensure hoist hook(s) is (are) properly secured to GMT-BUMPER

- lift assembly to sufficient height in order to connect additional set GEO M6 if required
- set inter-angle values as described in section 8.2.3

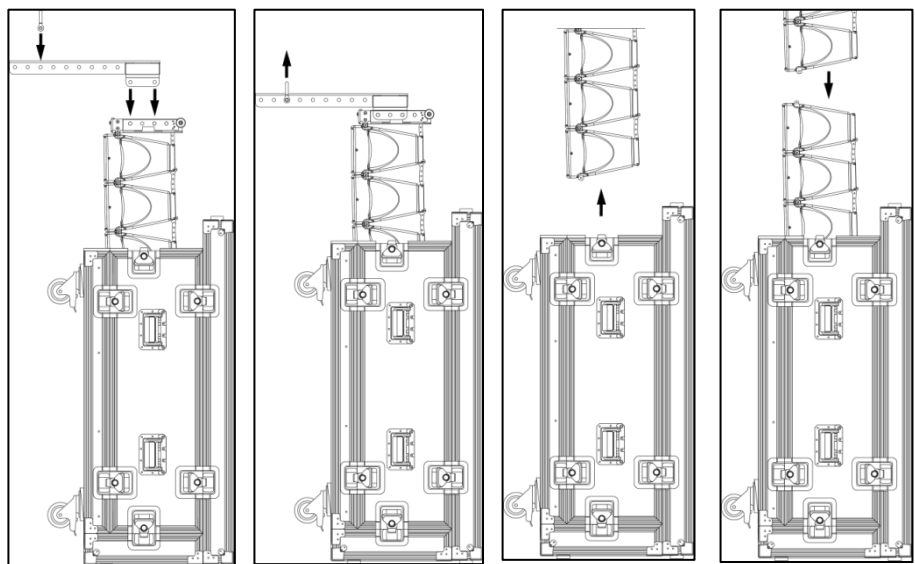
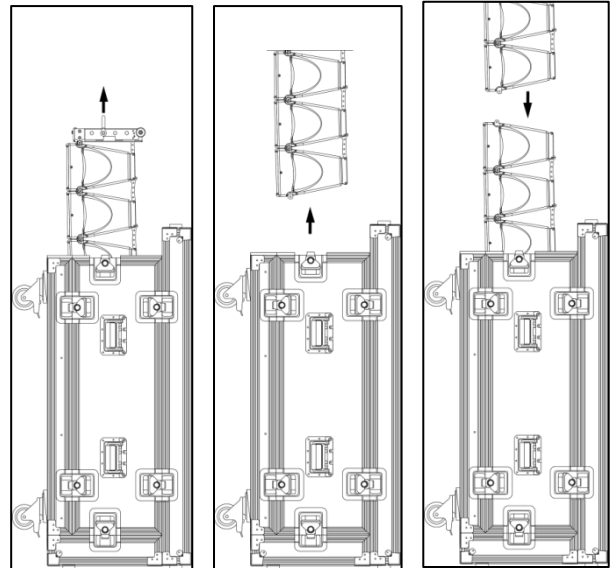
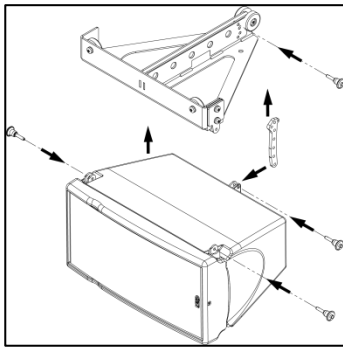
IMPORTANT

Ensure all pins are properly locked into Geo M6

- lift cluster to NS-1 defined rigging height, secure cluster horizontally to prevent it from rotating
- Secure bumper with secondary safety steel.

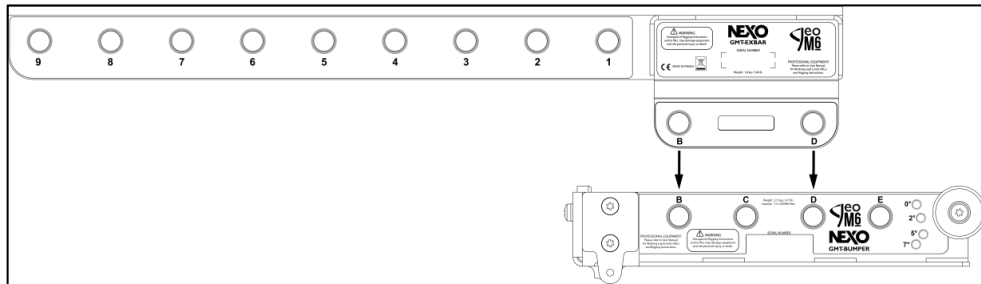
IMPORTANT

The requirements for secondary safety systems vary with territories. However, the secondary safety steel **MUST** have a SWL equivalent or greater than that of the rigging system.



Procedure with flight case set horizontally

- Open upper cover while the flight case is on its wheels
- Connect GMT-BUMPER to top cabinet 4 x VXT-BL515 quick release pins
- If required, connect GMT-EXBAR to GMT-BUMPER by inserting EXBAR clevis pins into GMT-BUMPER "B" and "D" holes
- Connect single hoist to required hole as indicated in NS1 design
 - o "A", "B", "C", "D" or "E" on GMT-BUMPER
 - o Or "1" to "9" if using GMT-EXBAR
 - o If using 2 hoists, connect these using extreme points ("A" and "E", or "A" and "9" or "9" and "E")



GMT-BUMPER and GMT-EXBAR referenced rigging points

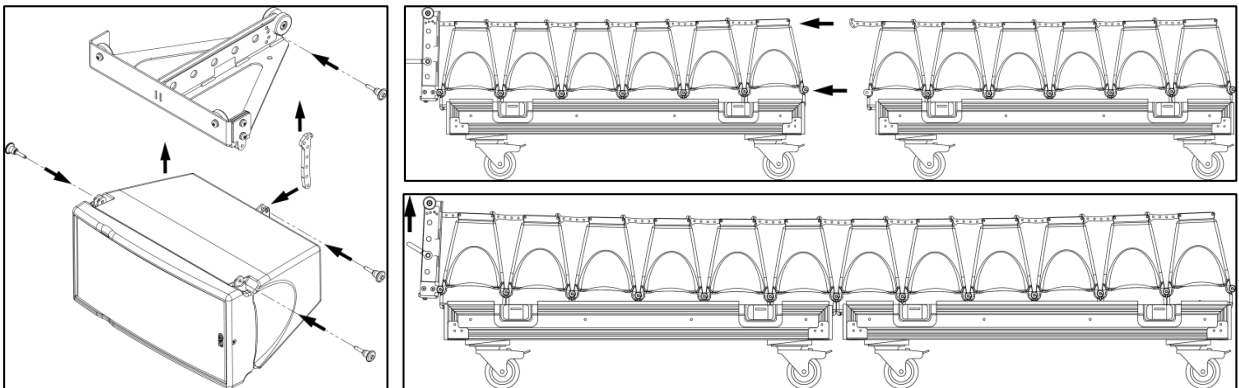
IMPORTANT
Ensure hoist hook(s) is (are) properly secured to GMT-BUMPER

- Start lifting bumper and position angle setting pins at required value as described in section 8.2.3
- Attach second set of 6 x GEO M6 to the first set by bring the second GEO M6 flight case adjacent to the first one, carry on lifting bumper and set inter-angle values for the second set of GEO M6

IMPORTANT
Ensure all pins are properly locked into Geo M6

- Lift cluster to NS-1 defined rigging height, secure cluster horizontally to prevent it from rotating
- Secure bumper with secondary safety steel.

IMPORTANT
The requirements for secondary safety systems vary with territories. However, the secondary safety steel MUST have a SWL equivalent or greater than that of the rigging system.



8.4 Testing and Maintenance of the system

General: Geo is a precision piece of equipment and requires regular attention to maintenance in order to give long and reliable service.

Rigging

NEXO recommends regular testing of loudspeaker rigging components, preferably using a suitable test rig coupled with a visual inspection.

Fasteners: there are several critical points in the LS18 and GEO M6 cabinets.

Of primary concern are:

- a) The grid screws attaching the grid to the cabinet
- b) The machine screws attaching the connecting plates to the cabinet.
- c) The screws attaching the directivity flanges to the front of the cabinet.

These fasteners should be regularly checked and tightened as necessary.

Cleaning: The exterior of the cabinet and the rigging system can be cleaned with a damp cloth soaked in mild soapy water. On no account use solvent based cleaners , which may damage the finish of the cabinet

After cleaning, the rigging system must be treated with a suitable lubricant to prevent rusting. NEXO recommends the use of Scottoil FS365 which is a water-based lubricant with a mixture of machine oil, surfactant and anti-rust treatment.

Acoustics

NEXO recommends periodical check of impedance and frequency response by using FFT analyse software such as Systune, Smaart, WinMLS or equivalent.

9 SYSTEM ALIGNMENT GUIDELINES

The NXAMP’s factory delay presets are optimised to provide the best possible crossover between the GEO M6 and LS or RS Subwoofers systems. The reference point for this adjustment is the front of each cabinet. (This means that the internal delays needed to achieve a correct time alignment are set for cabinets standing next to each other with both fronts aligned). We recommend that the system is adjusted so that arrivals from GEO M6 and LS or RS subwoofers are coincident at a fairly distant listening position.

9.1 GEO M6 Vertical Cluster design

Cluster design must be done with NS-1, which provides very intuitive and fast method to determine all cluster geometry parameters in relation to venue where cluster is implemented.

NS-1 is a freeware available for all Nexo users. Please contact your local distributor for licensing procedure.

IMPORTANT

Never install a GEO M6 cluster without checking its acoustical performances and mechanical safety in NS-1 prior to installation.

Please contact your local distributor for assistance and/or training NS-1

9.2 Stacked LS18s and Flown GEO M6

In the example below, r_1 being the distance from GEO M6 array to listener position, and r_2 being the distance from LS18 to listener position, the distance difference is then $r_1 - r_2$ (specified meters or feet).

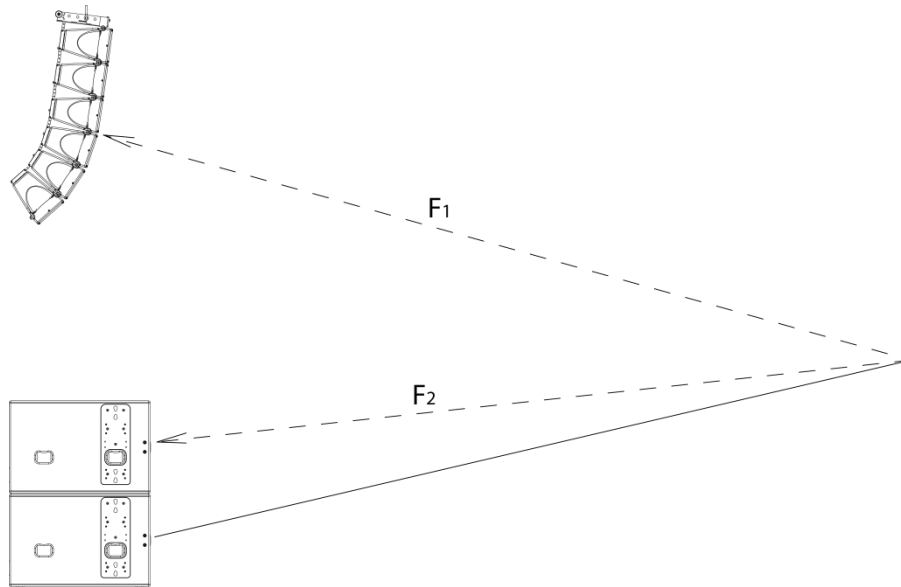
$r_1 > r_2$, the delay should be set on the LS18 NXAMP TDcontroller channel.

$r_1 < r_2$, the delay should be set on the GEO M6 NXAMP TDcontroller channel

To convert the result in time delay (specified in seconds), apply:

$$\Delta t = (r_1 - r_2) / C \quad r_1 \text{ and } r_2 \text{ in meters, } C \text{ (sound speed)} \approx 343 \text{ m/S.}$$

Set the units to meters, feet or seconds according to your preference). Delay will have to be adjusted according to the distance difference $r_1 - r_2$ (see figure below).



9.3 Driving the LS18s from the AUX send

It is quite common to use the AUX send of a mixing desk to drive the Sub section of a PA system. This gives the mixing engineer more flexibility to set the level of the sub bass relative to the main PA, apply special effects, or to use a different EQ on the Sub. However, it also raises some serious issues for the performance & safety of the system (mostly time alignment).

At NEXO, great care is taken to design optimum phase alignment from one octave above to one octave below the crossover frequency point. By doing so, drivers are working perfectly together and providing the best efficiency possible. It is then up to the user to adjust the delay on the NXAMP to match the physical path difference of the different systems. It is thus possible to get a well-adjusted system, even without measuring instruments.

If LS18s are driven from an AUX output, NXAMPs are fed with two signals coming from different sources. If those two sources (MAIN output & AUX send) are not exactly in phase, delay is introduced into the crossover between the GEO M6 array and the LS18s. It is then mandatory to use proper measurement tool to optimize phase response.

Why is it unlikely that AUX and MAIN outputs have the same phase?

- Signal paths are likely to be different; any filter modifying the bandwidth and EQ of the signal is also affecting the phase.
Example: a 24dB/oct high pass filter set at 15Hz is affecting amplitude of the signal by only 0.6dB at 30Hz, but the phase shift is 90°!! At 100Hz we can still measure 25° of phase shift.
- Limiting bandwidth with a low pass filter can introduce a phase difference of up to 180° (completely out of phase) at the cross over point.
- If the signal is passing through any digital equipment, between 1.4ms and 2.2ms is being added (around 70° phase shift at 100Hz) due solely to the converter delay! The additional delay due to the processing itself (look ahead compressor, delay...) can be quite important as well.

If both outputs are not measured in the actual configuration, it is very likely that phase alignment will not be correct.

Consequences of badly aligned systems

Mis-aligned systems have lower efficiency: i. e. for the same SPL the system will have to be driven harder, activating the displacement & temperature protection at lower output levels. Both sound quality and reliability will decrease as the system is stressed.

Precautions & Checks

Before using the AUX of a mixing desk, ensure that MAIN and AUX outputs are in phase;

Always apply identical EQ or processing on both channels, so that the phase relationship will not be altered;

Never add additional low pass filtering on the SUB or high pass filtering on the main system;

Inverting polarity on one channel should always result in a massive difference near the crossover point. If that is not the case, the system is no longer aligned.

9.4 Recommended installation tools and equipment

Tape measure – should be 30m/100ft in length and be of durable fibre material. Have one per array available to speed up the installation process.

Laser Inclinator – For measuring vertical and horizontal angles in the venue. An ideal product is the Calpac 'Laser projecting a dot' version which costs approximately 60 €.

Spirit level – used to ascertain the trueness of the surface from which the angle measurements originate.

Rangefinder measuring device – either a Disto type laser measure or an optical laser rangefinder can be used. Devices such as the Bushnell 'Yardage Pro' sports rangefinders provide sufficiently accuracy and are easy to use. They have the additional advantage of working very well in bright sunlight.

Electronic calculator with trigonometric functions to calculate the height from ground level to points in the room. The formula to calculate height of a point from measured angle and distance is:

Height of point = $\sin(\text{vertical angle in degrees}) \times \text{distance to point}$

NB: Take care when using spreadsheets as they calculate using radians by default. To convert degrees to radians use the formula:

Angle (in radians) = $3.142 \times \text{Angle (in degrees)} / 180$

Computer – Laptop or Desktop PC running Windows XP with the current version of NEXO NS-1 installed. It is not possible to configure a Geo tangent array properly without using NS-1. Note that, when NS-1 designs are prepared prior to arrival at the venue, it is often necessary to modify or update the design to accommodate special circumstances. A PC is absolutely essential to make such changes.

Audio Analysis Software – recommended but not absolutely essential, programs such as Easera Systune, Smaart, WinMLS enable rapid and detailed analysis of the installation. Consider taking a training course in using one of these tools if you are not already competent with them – it will pay dividends in increased performance of the system.

10 GEO M6 – LS18s SYSTEM CHECK LIST

It is essential to execute all these check steps prior to perform a sound check on the “front end” to the system. Following this checklist step by step will prevent many troubles and will save time in the end.

10.1 Are the speakers properly connected and angled ?

Attach the first series of modules to the bumper.

Before flying, verify that all channels of all modules are functioning properly.

To check that all elements have the proper amplitude and phase, you should listen to the upper boxes at a close distance (<1 meter). You should be able to move from the top to the bottom of the cluster without hearing any change in the tonal balance.

Raise the bumper, attach the next series of modules and repeat the above checks.

Make sure that these series of modules sum properly with the modules above them.

When all the modules are flown, check that the aiming angles are the same left and right.

Make sure that multiple GEO M6 and LS18 are summing properly: 6 dB gain per doubling of quantity.

10.2 Final Pre-Sound Check Check

Play a CD track mono left, and then right: both sides must sound strictly identical. When listening in the centre between Left and Right GEO M6's, everything from LF to HF should be located to the “phantom centre” position. If not, repeat the above check sequence to identify the source of the problem.

11 TECHNICAL SPECIFICATIONS

11.1 LS18 Subwoofer

11.1.1 System specifications

SYSTEM SPECIFICATIONS		LS18 with NXAMP TD Controller
Frequency Response [a]		35 Hz - 120 Hz \pm 3dB
Usable Range @-6dB [a]		32Hz - 130 Hz
Sensitivity 1W @ 1m [b]		107 dB SPL Nominal
Nominal Peak SPL @ 1m [b]		137 to 140 dB Peak
Nominal Impedance		8 Ω
Crossover Frequencies		60 Hz – 85 Hz - 120 Hz Active
Amplified Controller		NXAMP4x1: 2 x LS18 in parallel on 2 bridged channels NXAMP4x4: 2 x LS18 on 1 channel
SYSTEM OPERATION		
Electronic Controller		The NEXO NXAMP presets are precisely matched to the LS series cabinets and include sophisticated protection algorithms. Using LS Series cabinets without a properly connected NXAMP will result in poor quality and can damage components
Speaker Cables		LS18 is wired 1- & 1+ on 2 In/Out Speakon connectors
PRODUCT FEATURES		LS18 (LS18e)
Components:		1 x 18" (46cm) 4" voice coil long excursion 8 Ω driver
Height x Width x Depth		510 x 675 x 775 mm (20.1" x 26.1" x 30.5")
Weight : Net		55.5 kg excluding accessories (122.3 lb)
Connectors		2 x NL4MP Speakon 4 pole
Construction		Baltic Birch Ply & structured black coating
Fittings: Handles		4 metal recessed pockets (None)
Front finish		Molded Dark Grey Metal Grill
Flying Points		Two side plates connecting with external accessories (None)
Stand fittings		Internal Steel Stand Fitting on Top (35mm, 1"3/8) allows pole mounting for Geo M6

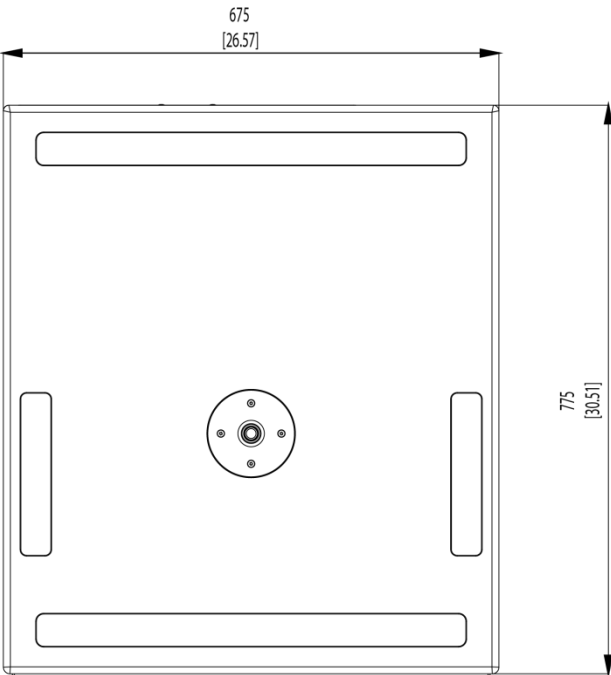
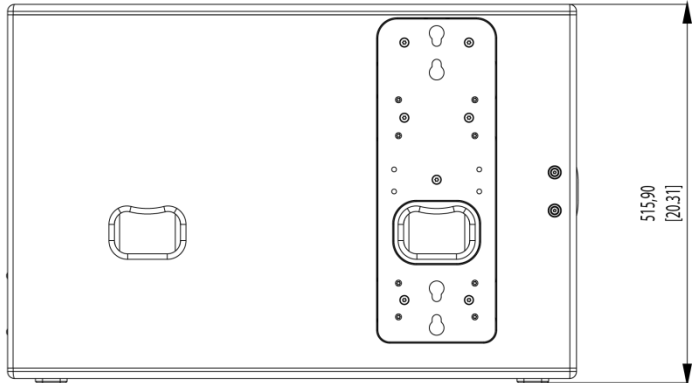
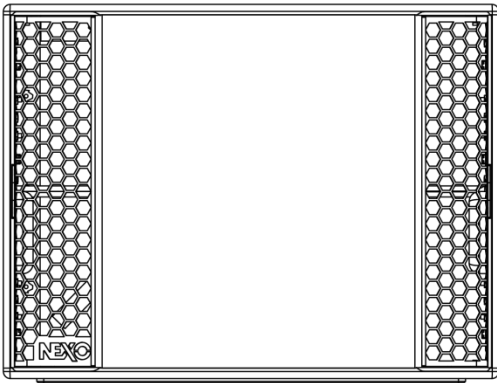
As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

[a] Response curves & data : Half-Space Anechoic radiation for the LS18 + NXAMP.

[b] Sensitivity & Peak SPL data : these will depend on spectral distribution and crest factor of program material. Measured with band limited Pink Noise., Wideband to the specified \pm 3dB range. Data are for speaker + processor + recommended amplifier combinations. Peak SPL is at clipping + recommended amplifier.

[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

11.1.2 Dimensions



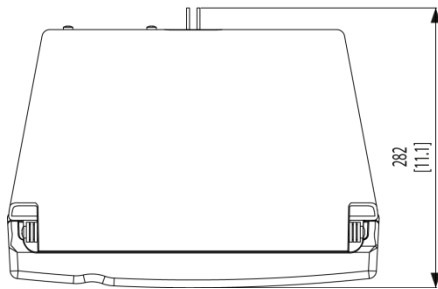
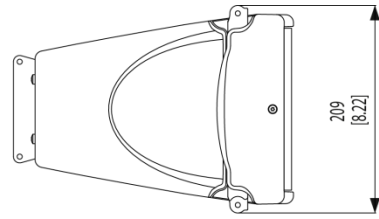
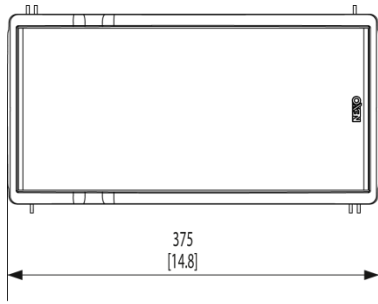
11.2 GEO M620 Module

11.2.1 System specifications

SYSTEM SPECIFICATIONS		GeoM620 with NEXO controller setup
Frequency Response		80 Hz - 19 kHz \pm 3dB
Usable Range @-6dB		75Hz - 20 kHz
Sensitivity 1W @ 1m		95 dB SPL Nominal
Nominal Peak SPL @ 1m		128 dB
HF Dispersion		80° or 120° Horizontal
Crossover Frequencies		LF-HF: 2 kHz Passive
Nominal Impedance		8 Ω
Recommended Amplifiers		450W per box (3 boxes max in parallel on one channel amplifier)
PRODUCT FEATURES		GeoM620
Components : LF] HF		LF: 1x 6.5", 8 ohms long excursion driver HF : 1x 1" throat driver on a BEA/FEA optimized HR Wavesource
Height x Width x Depth		191 x 373 x 260 mm
Weight : Net		9.7 kg
Connectors		2 x NL4 Speakon 4 poles
Construction		Lightweight Polyurethane composite
Fittings: Handles		Side "Geo" Handles
Front finish		Acoustic Fabric fitted front grill
SYSTEM OPERATION		
Electronic Controller		The NEXO controller's presets are precisely matched to the GeoM Series cabinets and include sophisticated protection. Using GeoM Series cabinets without a properly connected NEXO controllers will result in poor sound quality and can damage components.
Dispersion configuration		Flanges
Speaker Cabling		2+2-

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

11.2.2 Dimensions



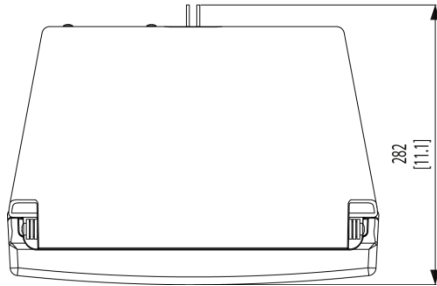
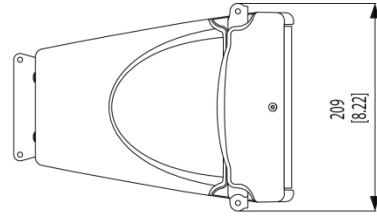
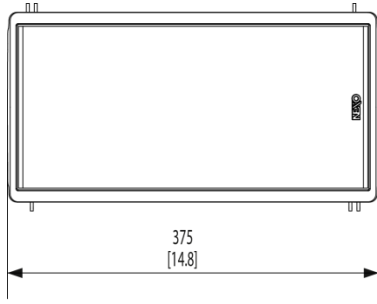
11.3 GEO M6Bass Module

11.3.1 System specifications

SYSTEM SPECIFICATIONS		GeoM6Bass with NEXO controller setup
Frequency Response		75 Hz - 120 Hz \pm 3dB
Usable Range @-6dB		70Hz - 120 Hz
Sensitivity 1W @ 1m		94 dB SPL Nominal
Nominal Peak SPL @ 1m		125 dB
Nominal Impedance		8 Ω
Recommended Amplifiers		450W per box (3 boxes max in parallel on one channel amplifier)
PRODUCT FEATURES		GeoM6Bass
Components : LF		LF: 1x 6,5", 8 ohms long excursion driver
Height x Width x Depth		191 x 373 x 260 mm
Weight : Net		7.6 kg
Connectors		2 x NL4 Speakon 4 pole
Construction		Lightweight Polyurethane composite
Fittings: Handles		Side "Geo" Handle
Front finish		Acoustic Fabric fitted front grill
SYSTEM OPERATION		
Electronic Controller		The NEXO controller's presets are precisely matched to the GeoM Series cabinets and include sophisticated protection. Using GeoM Series cabinets without a properly connected NEXO controllers will result in poor sound quality and can damage components.
Speaker Cabling		1+/1-

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

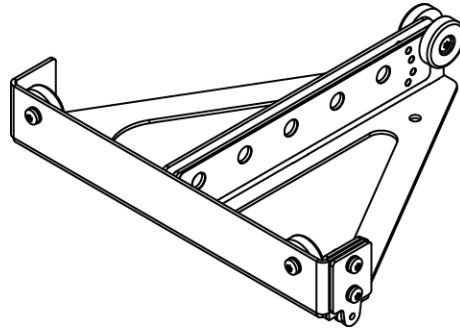
11.3.2 Dimensions



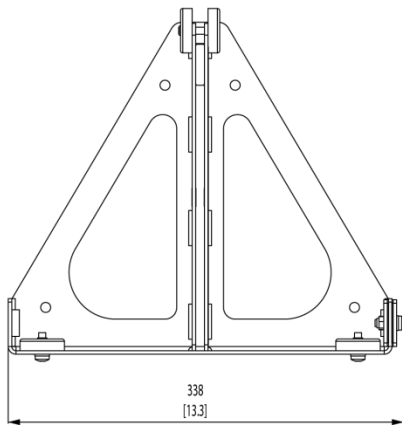
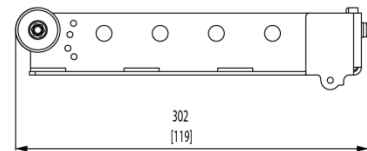
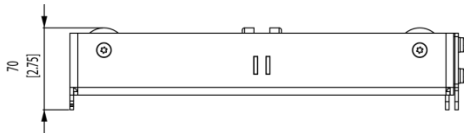
11.4 **GEO M6 Accessories**

11.4.1 **GMT-BUMPER**

Parts



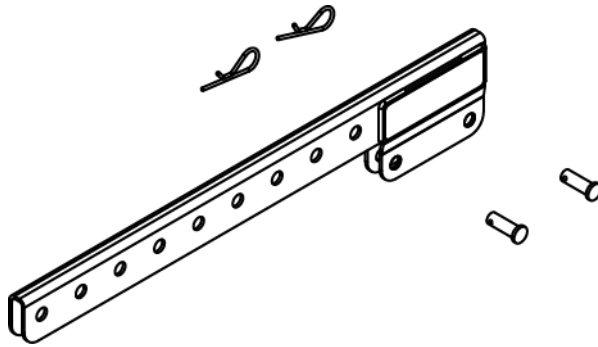
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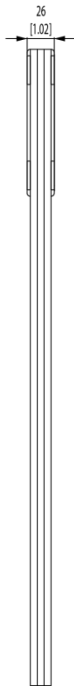
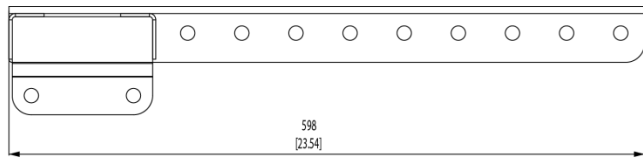
Weight : 2,25 kg / 4.96 lb

11.4.2 GMT-EXBAR

Parts



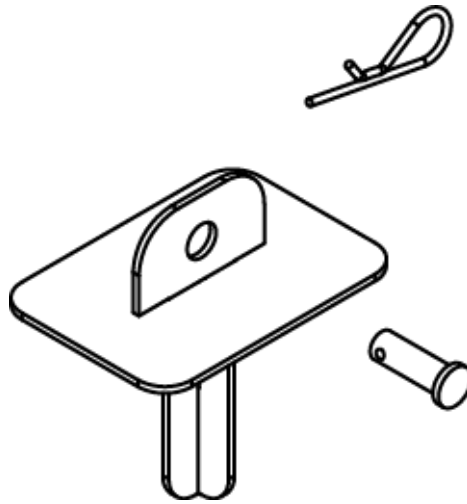
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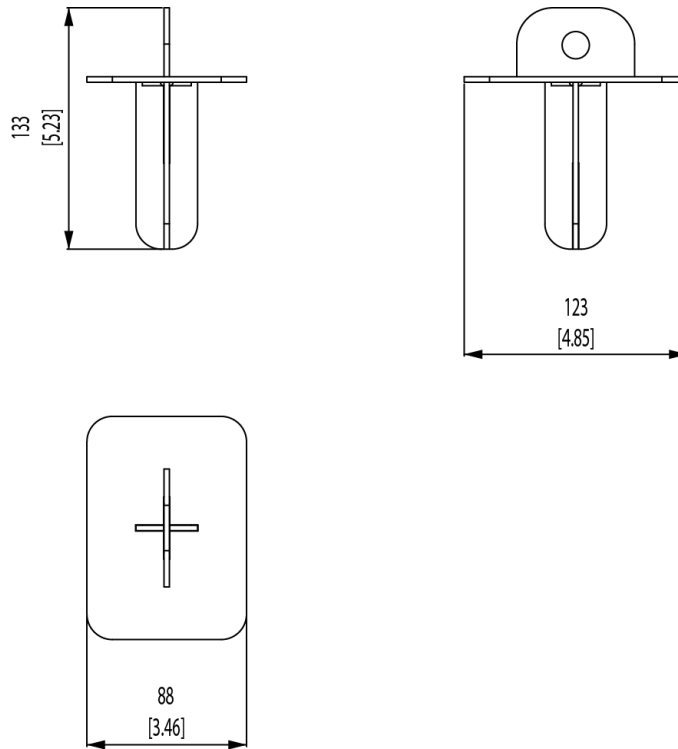
Weight : 2,25 kg / 4.96 lb

11.4.3 GMT-BPDAPT

Parts



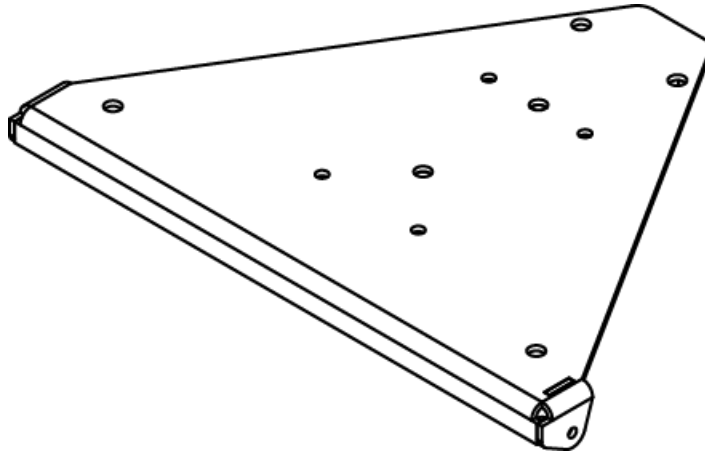
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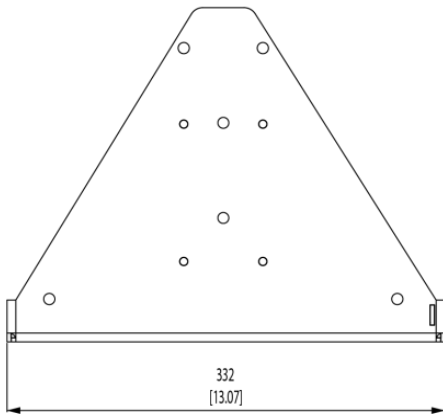
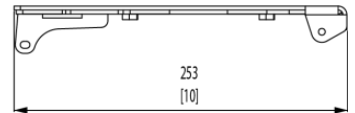
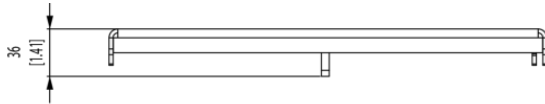
Weight : 0,5 kg / 1.10 lb

11.4.4 GMT-LBUMPER

Parts



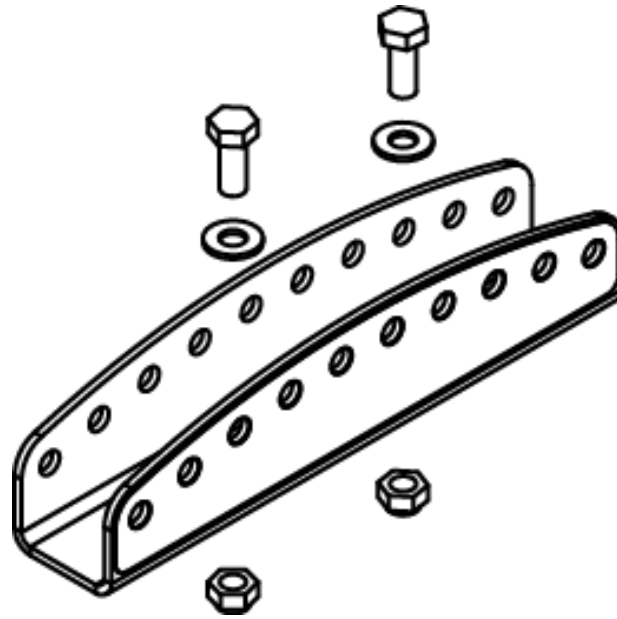
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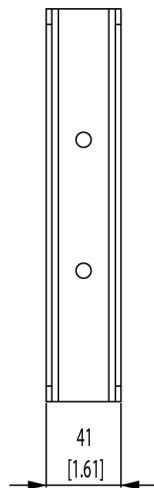
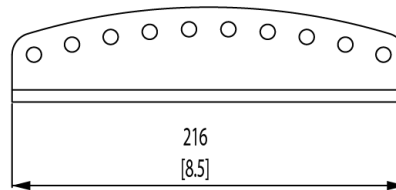
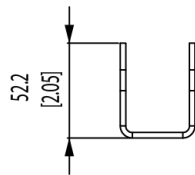
Weight : 1,8 kg / 3.96 lb

11.4.5 GMT-LBPADPT

Parts



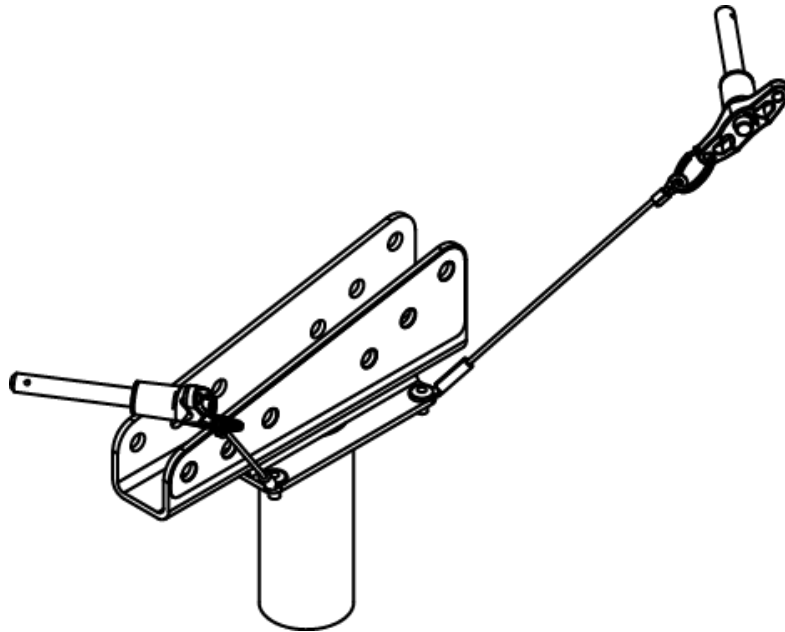
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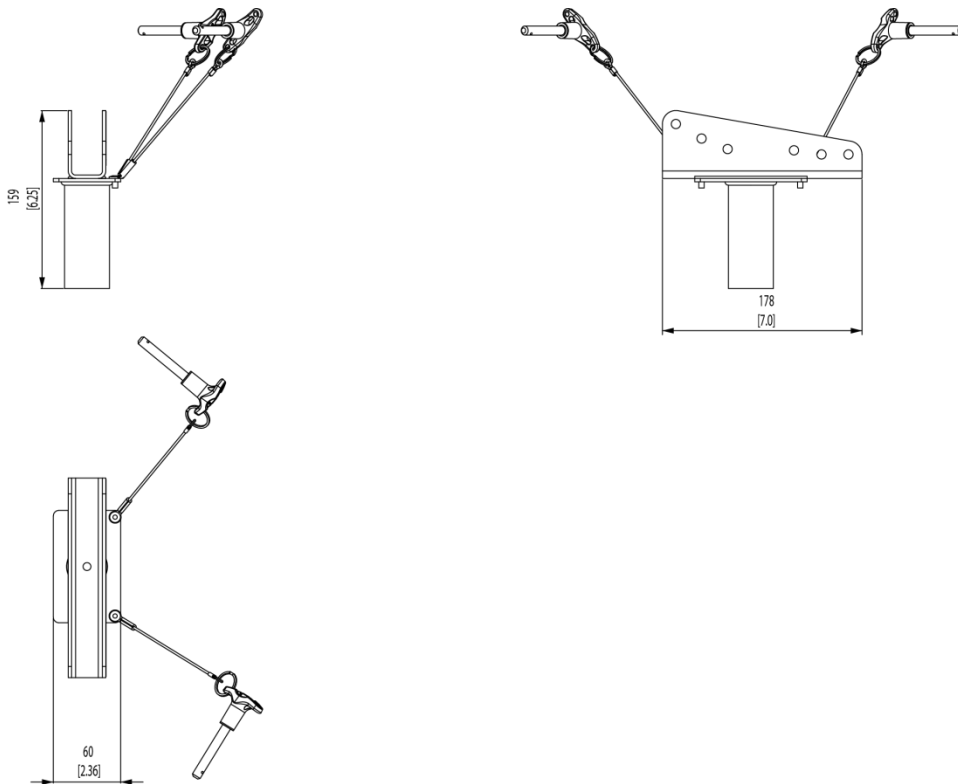
Weight : 0,7 kg / 1.54 lb

11.4.1 VNT-POLE

Parts



Dimensions

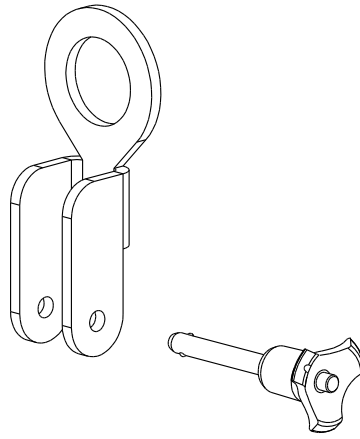


Weight : 0,9 kg / 1.98 lb

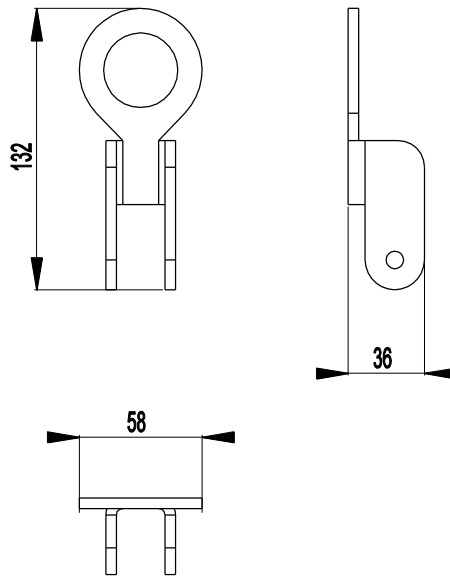
11.4.2 VNT-XHBRK

Parts

04VNT-XHBRK



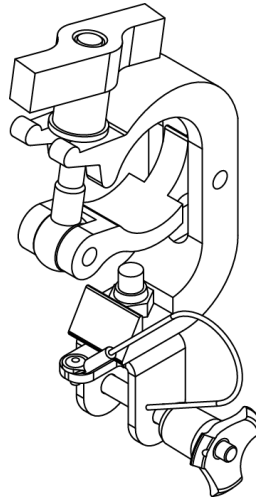
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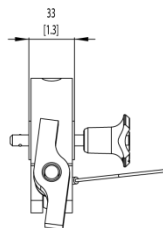
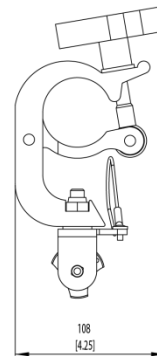
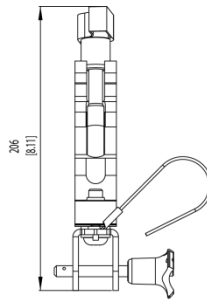
Weight (kit) : 0,3 kg / 0.661 lb

11.4.3 VNT-TCBRK

Parts



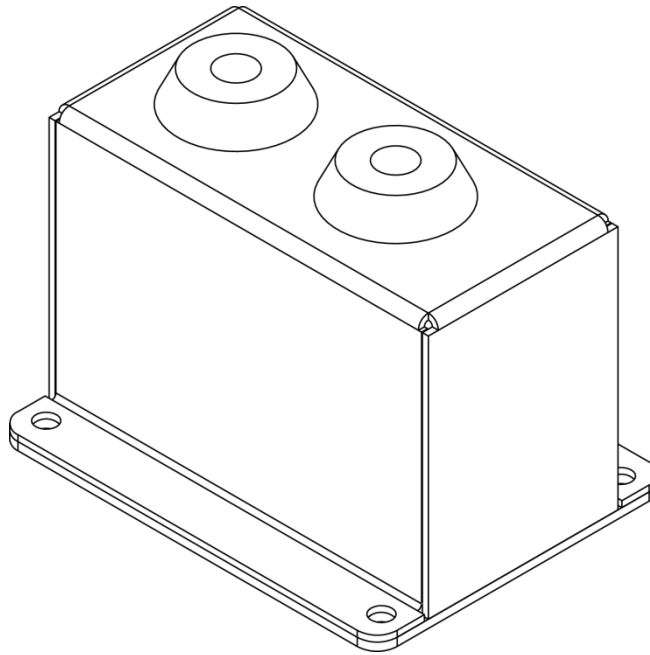
Dimensions



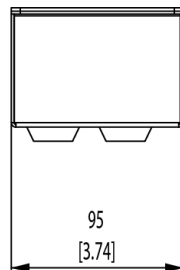
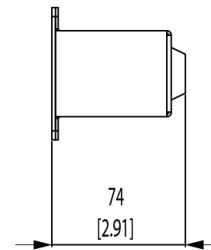
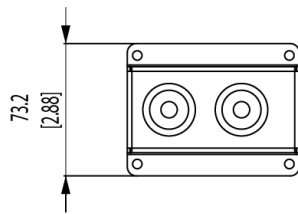
Weight (kit) : 0,620 kg / 1.37 lb

11.4.1 GMT-IPCOV

Parts

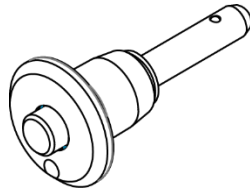


Dimensions



Weight : 0,34 kg / 0.013 lb

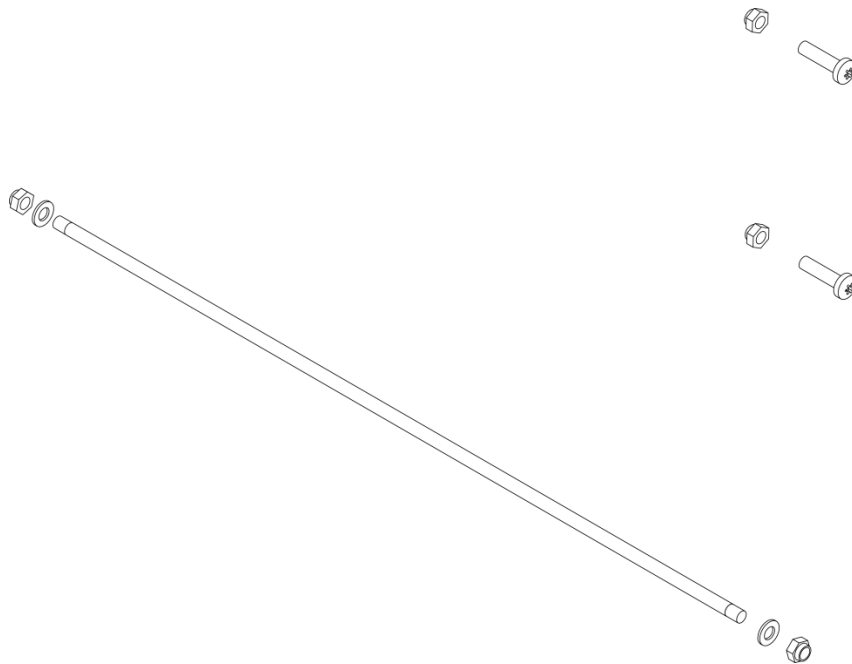
11.4.2 VXT-BL515 PUSH PINS



Weight : 0,012 kg / 0.0004 lb

11.4.3 GMT-BNFIK

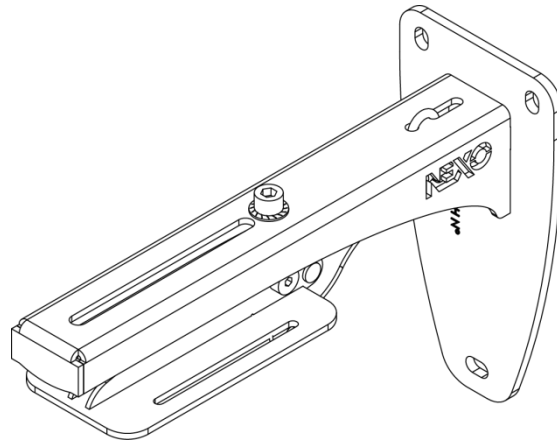
Parts



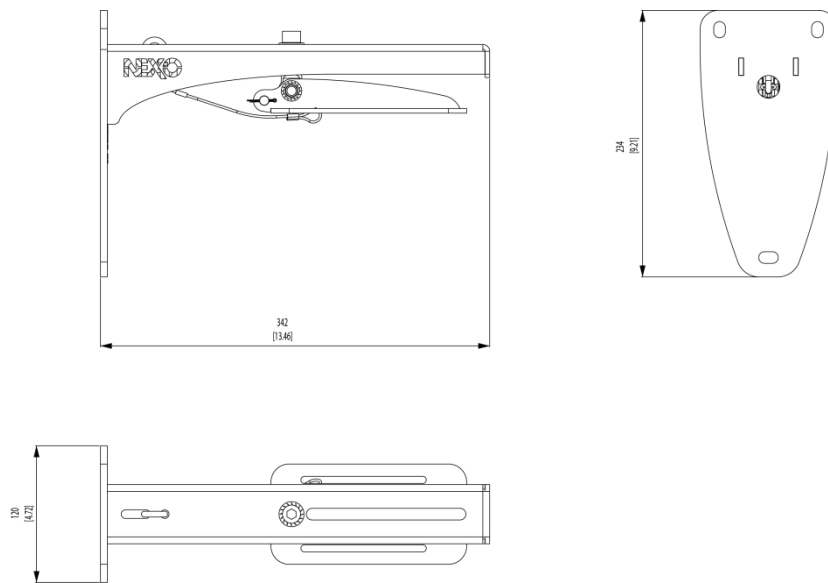
Weight (kit) : 0,2 kg / 0.008 lb

11.4.4 VNI-WS15

Parts

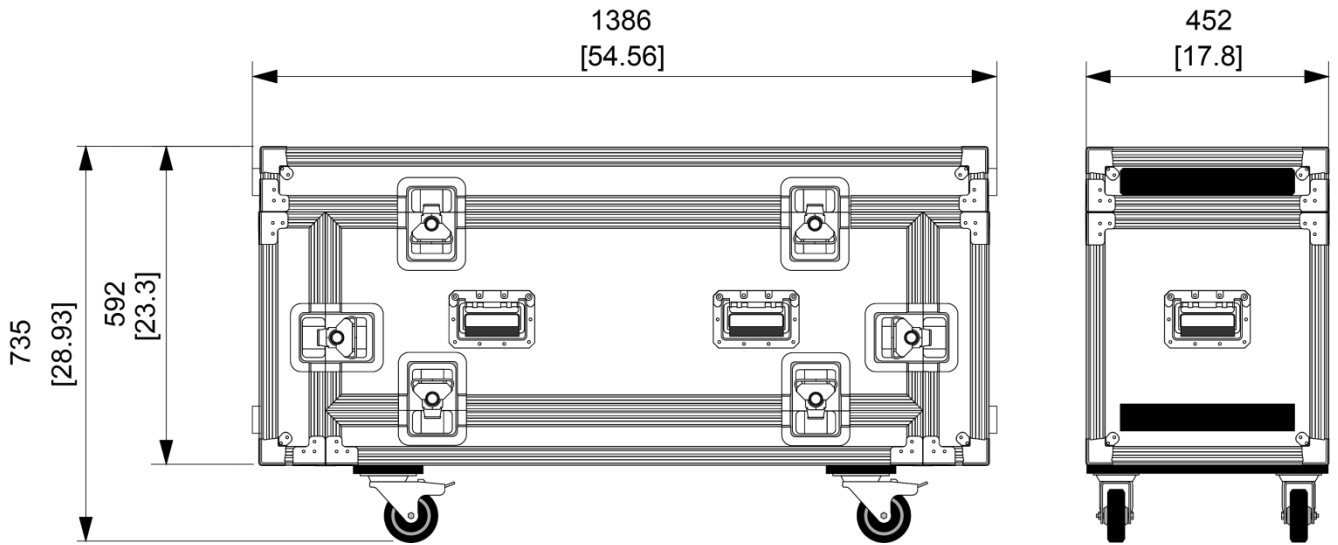


Dimensions



Weight (kit) : 2,8 kg / 0.11 lb

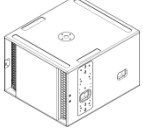


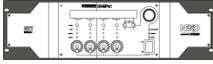
11.4.5 GMT-6CASE



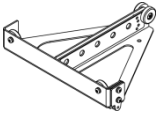
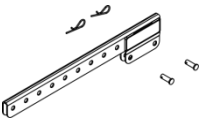
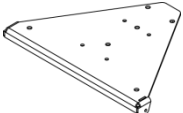


Weight : 57 kg / 2.24 lb




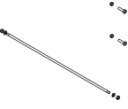
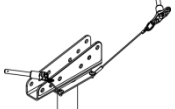
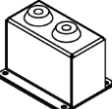
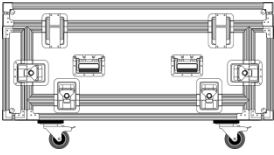

12 GEO M6 SERIES PARTS & ACCESSORIES LIST

12.1 Modules & Control Electronics List

MODEL	DRAWING	DESCRIPTION
LS18		Subwoofer Module
GEO M620		GEO M620 Module
GEO M6B		GEO M6B Module
NXAMP4x1		Digital Powered Controller 4x1300W

12.2 Accessories List

MODEL	DRAWING	DESCRIPTION
GMT-BUMPER		Main GEOM6 Bumper (up to 12 x GEO M6 maximum)
GMT-EXBAR		Extension Bar for GMT-BUMPER
GMT-LBUMP		Light GEO M6 Bumper (up to 3 x GEO M6 maximum)
GMT-LBPADPT		Adaptor for GMT-LBUMP
VXT-BL515		5x15 Quick Release Pin for Geo M6

MODEL	DRAWING	DESCRIPTION
VNT-XHBRK		Cable clamp for GMT-LBADPT (includes 8x45 Quick Release Pin).
VNT-TCBRK		Truss clamp for GMT-LBADPT (includes 8x45 Quick Release Pin)
GMT-BPADPT		Pole Mount for GMT-BUMPER
GMI-BNFIK		GEO M6 Connection kit for fix installation
VNT-POLE		Pole Mount for GMT-LBUMP
GMI-IPCOV		Connector protection for IP54 rating
GMT-6CASE		Flight Case for 6 x GEO M6 + Hardware
VNI-WS15		Wall Mount suspension for GMT-LBUMP

13 USER NOTES

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