DP2503-03-CM

GEO S12 EN54

GEO S1210 EN54 & GEO S1230 EN54
GEO S1210-ST EN54 & GEO S1230-ST EN54
Tangent Array Modules

System manual

CONTENTS

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 Phase Directivity 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. NEXO Digital TDcontroller technology provide driver protection and system optimization for the GEO S and LS series.

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 curved vertical or horizontal 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

In the past, 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 now 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 0.1° 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,” “High Frequency compensation”, 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 S 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.

Sun exposure: Do not expose the speaker system to direct sun.

Operating temperature with temperate climate: 0°C to +40°C (-20°C to +60°C for storage).

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.

Please check the web site nexo-sa.com for the latest update.

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 4 times 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 use 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.
- in case of wind greater than 8 on Beaufort scale (72km/h – 45mph), a touring system has to be landed or an additional securing has to be implemented.
- for fixed installations, wind loading has to be taken into account in accordance to the national standards.

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 be applied to the system on a 5 mn period to allow the loudspeaker components to stabilize during the very first minutes of usage.

Inspect the speaker system periodically.

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.

1 COMPLIANCE

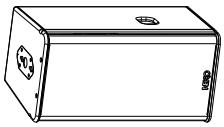
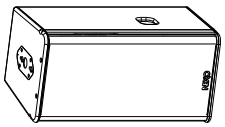
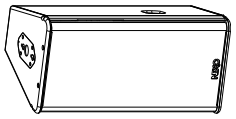
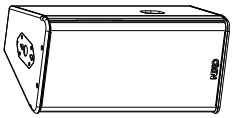
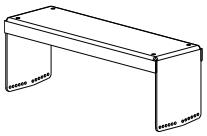
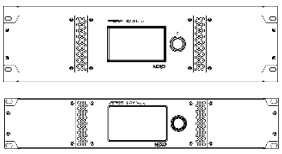
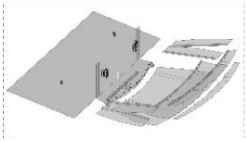
GEO S12 EN54 is certified EN54-24 by AFNOR Certification

CE 0333
NEXO Parc du Pré de la Dame Jeanne BP5 - FR 60128 PLAILLY – France Tel : +33 3 44 99 00 70 – Fax : +33 3 44 99 00 30 – email : info@nexo.fr – nexo-sa.com
EN54-24 :2008 Voice alarm loudspeaker for fire detection and fire alarm systems for buildings DoP NX-0333-CPR-075518 Type B Technical data and setup instructions included in this manual
GEO S1230 EN54 – GEO S1230ST EN54 – GEO S1210 EN54 – GEO S1210ST EN54

2 INTRODUCTION

Thank you for selecting a NEXO GEO S12 EN54 Series Tangent Array System.

This manual is intended to provide you with necessary and useful information about your GEO S12 EN54 System, which includes the following products:

	• GEO S1210 EN54 is a 10° Tangent Array Module. It comprises 1x12" (30cm) 16 ohms Neodymium LF/MF driver loaded by a Phase Directivity Device (PDD™) and 1x1.4" throat 16 Ohm HF driver loaded by a 5° Hyperboloid Reflective Wavesource (HRW™).
	• GEO S1210-ST EN54 is the long throw version of the GEO S1210 EN54. It is strictly identical but features a Neodynium HF driver.
	• GEO S1230 EN54 is a 30° Tangent Array Module. It comprises 1x12" (cm) 16 ohms Neodymium LF/MF driver loaded by a Phase Directivity Device (PDD™) and 1x1.4" throat 16 Ohm HF driver loaded by a 28.5° Hyperboloid Reflective Wavesource (HRW™).
	• GEO S1230-ST EN54 is the long throw version of the GEO S1230 EN54. It is strictly identical but features a Neodynium HF driver.
	• A full range of accessories provides safe, flexible and simple means of installing GEO S12 EN54 in fixed installation.
	• GEO S12 EN54 is controlled, powered and monitored by NEXO TDcontrollers. For a complete description of these controllers, please refer to User Manuals. NEXO TDcontrollers DSP algorithms and parameters are fixed in software and updated regularly. Please consult the NEXO web site (nexo-sa.com) for the latest software releases.
	• NS-1 simulation software assists in the design and implementation of vertical or horizontal tangent GEO arrays. Please consult the NEXO web site (nexo-sa.com) for the latest software releases.
	• Available for Mac, iPad and iPhone, NEXO NeMo provides full remote control over a digital audio network from anywhere in the venue, thanks to an intuitive and graphically attractive user interface. NeMo is available on Apple App Store.

Please devote your time and attention to reading this manual. A comprehensive understanding of GEO S12 EN54 specific features will help you to operate your system at its full potential

3 GEO S12 EN54 General Set-up Instructions

3.1 GEO S12 EN54 connections

GEO S12 EN54 is connected with Speakon NL4FC plugs (not supplied). A wiring diagram is printed on the connection panel located on the back of each cabinet. The 4 pins of the Speakon sockets identified in / out are connected in parallel within the enclosure.

Either connector can be used to connect amplifier or to link to an additional GEO S12 EN54 cabinet.

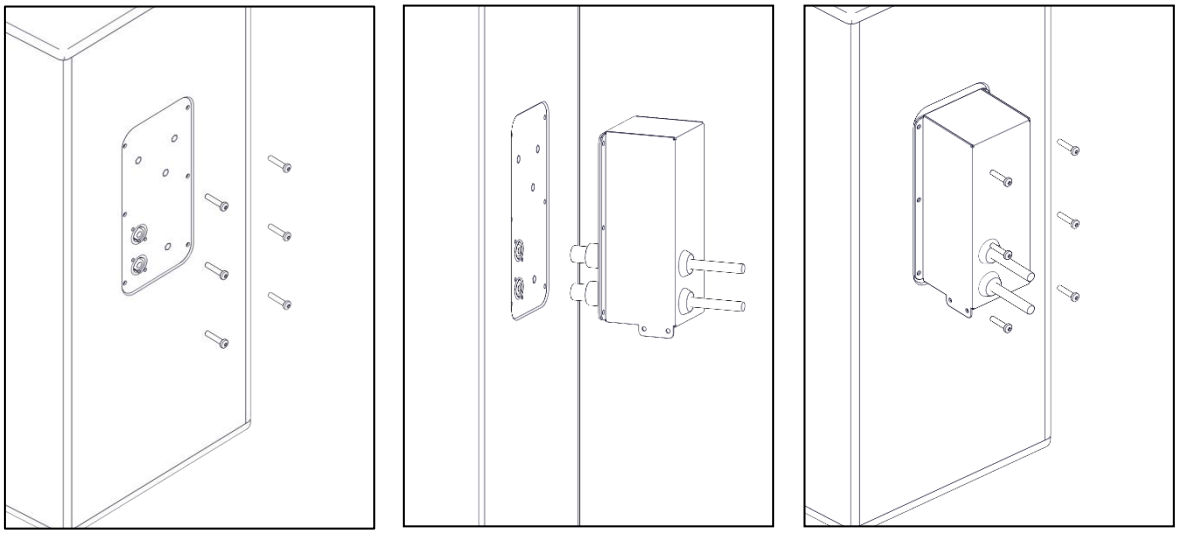
3.1.1 GEO S12 EN54 connectors

Speakon Connector	S1210 EN54 & S1230 EN54	
	Passive Mode	Active Mode
1(-)	Through	GEO S12 EN54 LF (-)
1(+)	Through	GEO S12 EN54 LF (+)
2(-)	GEO S12 EN54 (-)	GEO S12 EN54 HF (-)
2(+)	GEO S12 EN54 (+)	GEO S12 EN54 HF (+)

3.1.2 GEO S12 EN54 cabling procedure

In order to comply with IP rating, GEO S12 EN54 is equipped with a water-proof cover. Cabling and connecting must be done according to the following steps:

- Remove the six 5x20 screws from the connector panel
- Pass the cables through the cover waterproof cable gland
- Connect Speakon connectors to the connector panel NL4FC
- Mount the cover with the six 5x20 screws

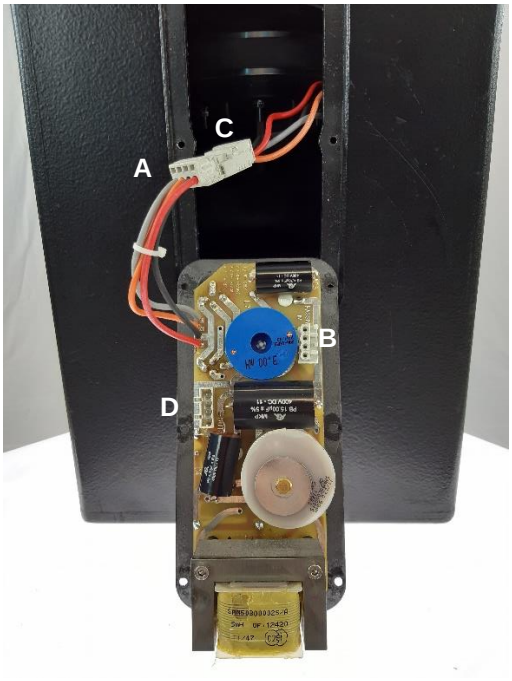


3.1.3 Configuring GEO S12 EN54 for passive or active mode

Remove the six TORX screws that hold the connector panel.

Remove the connector panel so that filter WAGO connectors become accessible.

GEOS12 connector panel



GEOS12 WAGO connectors

In Passive Mode, connector A (from filter) should be inserted in connector B (PCB “Passive In”), and connector D (“Passive Out”) should be connected to speakers via connector C.

In Active Mode, WAGO Connector A (from filter) should be directly connected into speakers via connector C (PCB connectors B & D are then unused).

Passive mode configuration

Active mode configuration

3.2 Cabling

NEXO recommends the exclusive use of multi-conductor cables to connect the system: the cable kit is compatible with all the cabinets, and there is no possible confusion between LF, MF and HF sections.

Cable choice consists mainly of selecting cables of the correct sectional dimension (size) in relation to the load resistance and the cable length. Too small a cable section will increase both its serial resistance and its capacitance; this reduces the electrical power delivered to the loudspeaker and can also induce response (damping factor) variations.

For a serial resistance less or equal to 4% of the load impedance (damping factor = 25), the recommended cable length is given by:

$$L_{max} = Z \times S \qquad S \text{ in } mm^2, Z \text{ in Ohm}, L_{max} \text{ in meters}$$

The table below indicates these values, for 3 common sizes.

Load Impedance (Ω)	2	2.6	4	5.3	8	16
Cable section	**Recommended Cable Length**					
1,5 mm² (AWG #15)	3m/10ft	3m/13ft	6m/20ft	8m/26ft	12m/39ft	24m/79ft
2,5 mm² (AWG #13)	5m/16ft	7m/23ft	10m/33ft	13m/44ft	20m/66ft	40m/131ft
4 mm² (AWG #11)	8m/26ft	10m/33ft	16m/52ft	21m/70ft	32m/105ft	64m/210ft
6 mm² (AWG #9)	12m/40ft	16m/52ft	24m/79ft	32m/104ft	48m/160ft	96m/315ft

Maximum allowed length is 4 times recommended length.

Example:

GEO S12 EN54 module has a 16 Ω nominal impedance in passive mode. When connecting 4 modules in parallel, total load impedance becomes 4Ω.

Recommended length for 4mm² / (AWG#11) is 16m / 52ft, maximum allowed length is 64m / 208ft.

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.

3.3 GEO S12 EN54 recommended amplification

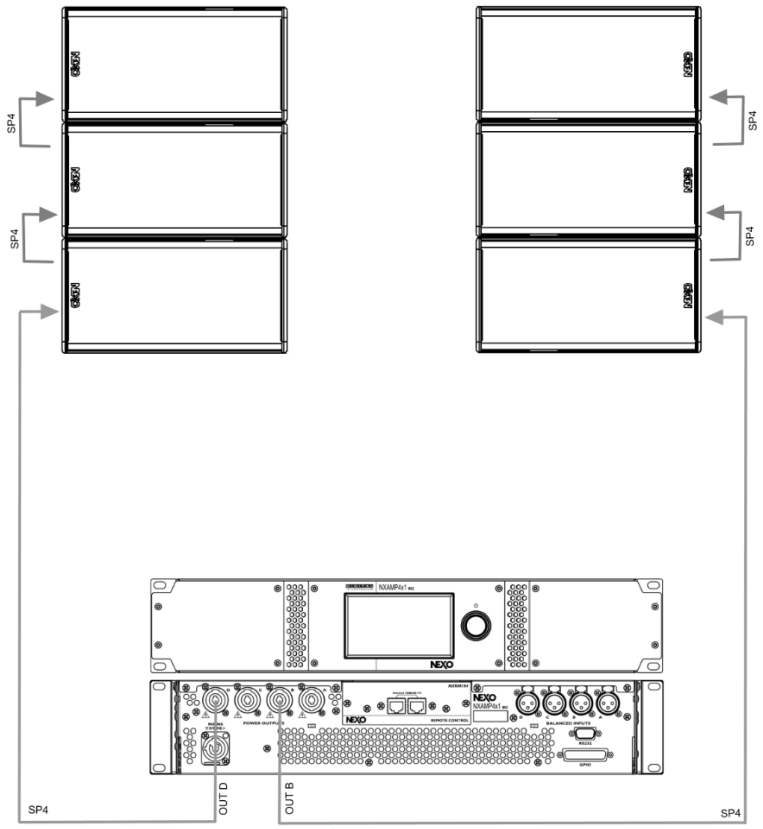
NEXO TD Controllers	Recommended amplification
NXAMP4x1mk2 Powered Controller Bridged Stereo mode (2x2.6kW/4Ω)	3 x GEO S12 EN54 in passive mode per bridged channel
NXAMP4x2mk2 Powered Controller 4 channels mode (4x2.5kW/2Ω)	1 x GEO S12 EN54 in passive mode per channel
NXAMP4x4mk2 Powered Controller 4 channels mode (4x4.5kW/2Ω)	4 x GEO S12 EN54 in passive mode per channel 4 x GEO S12 EN54 in active mode: 2 channels

3.4 GEO S12 EN54 setups on NEXO TD Controllers

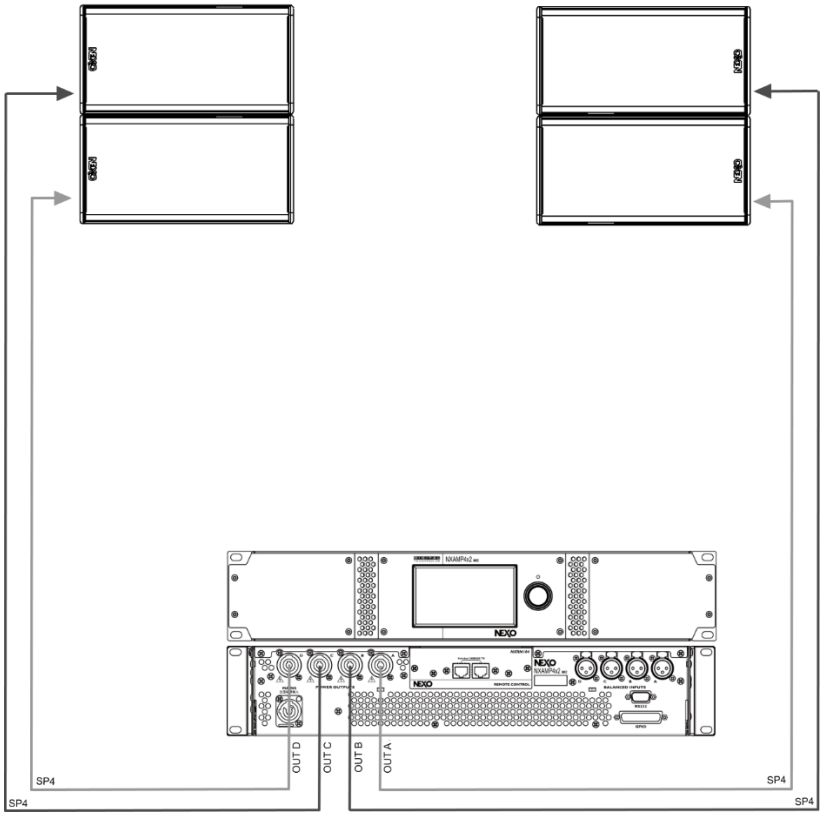
Please consult nexo-sa.com for NEXO TD Controllers firmware information.

4 CONNECTION DIAGRAMS

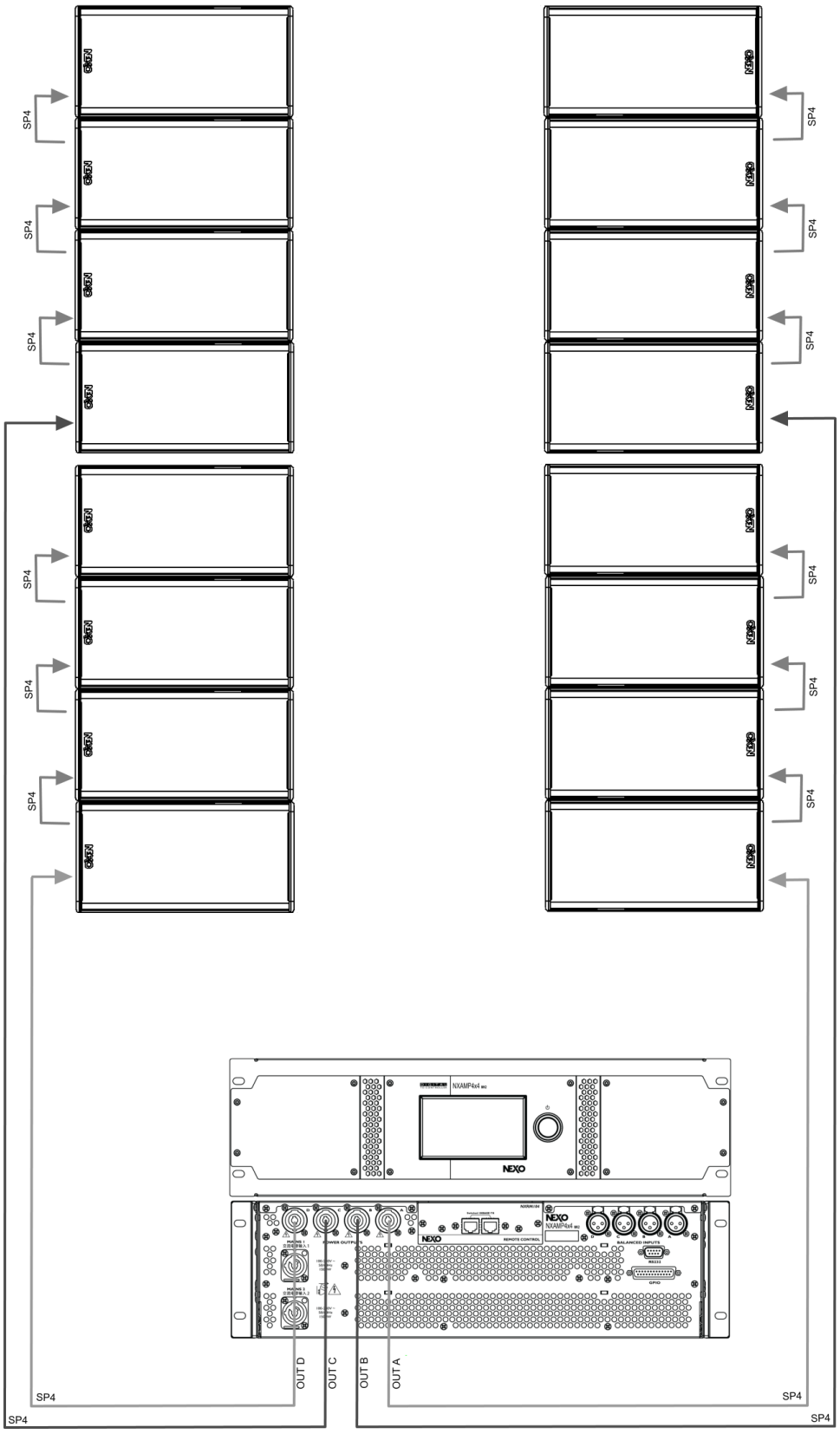
4.1 GEO S12 EN54 (passive mode) / NXAMP4x1mk2 (Bridge Stereo)



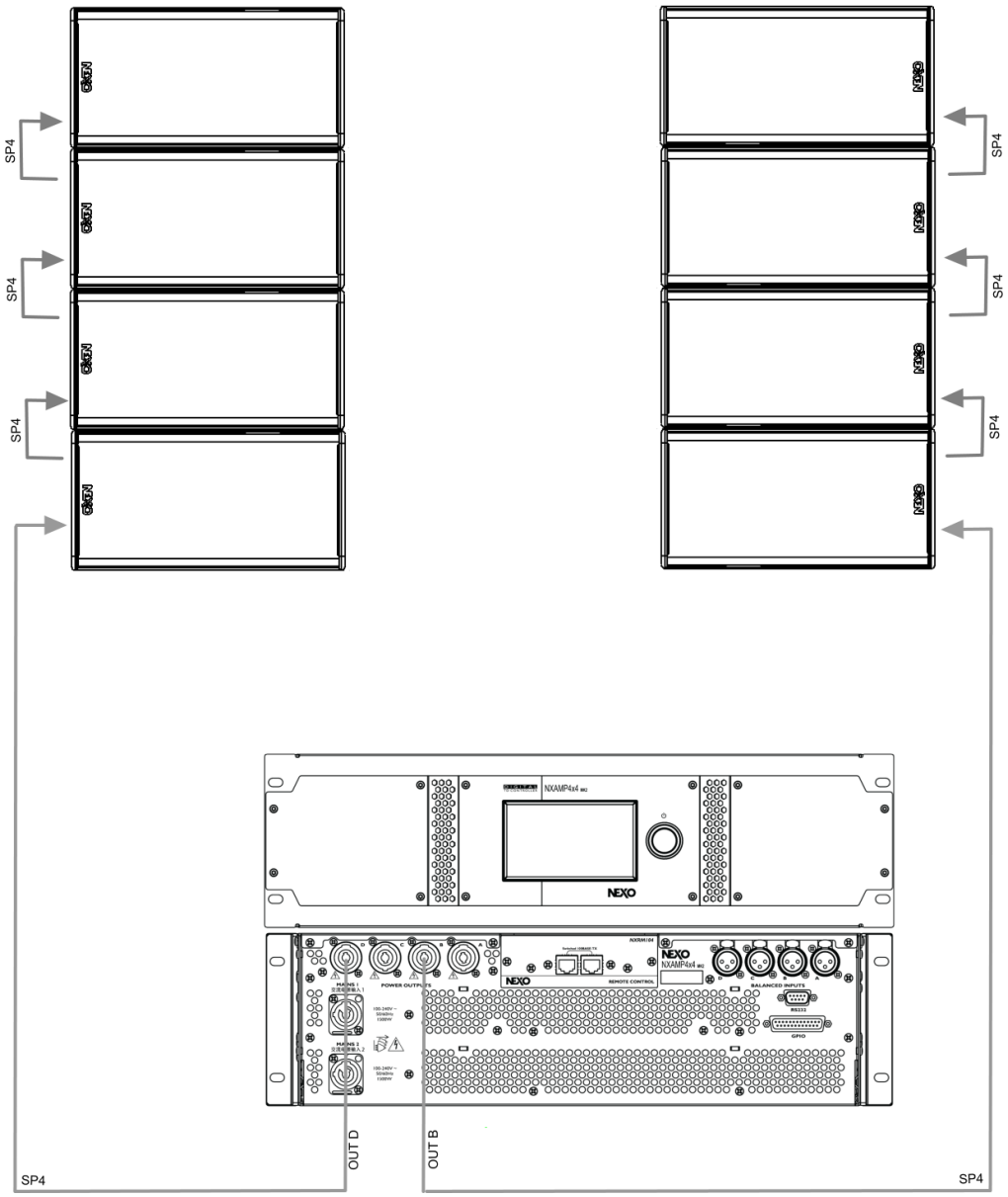
4.2 GEO S12 EN54 (passive mode) / NXAMP4x2mk2 (4 channels mode)



4.3 GEO S12 EN54 (passive mode) / NXAMP4x4mk2 (4 channels mode)



4.4 GEO S12 EN54 (active mode) / NXAMP4x4mk2 (4 channels mode)



5 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 10 degrees to determine the required amount number of GEO S1210 EN54 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 centre position, forces, moments, working load and safety factor.

GEO S12 EN54 Structural Analysis Report is currently being certified by German Certification Organization RWTUV systems GmbH.

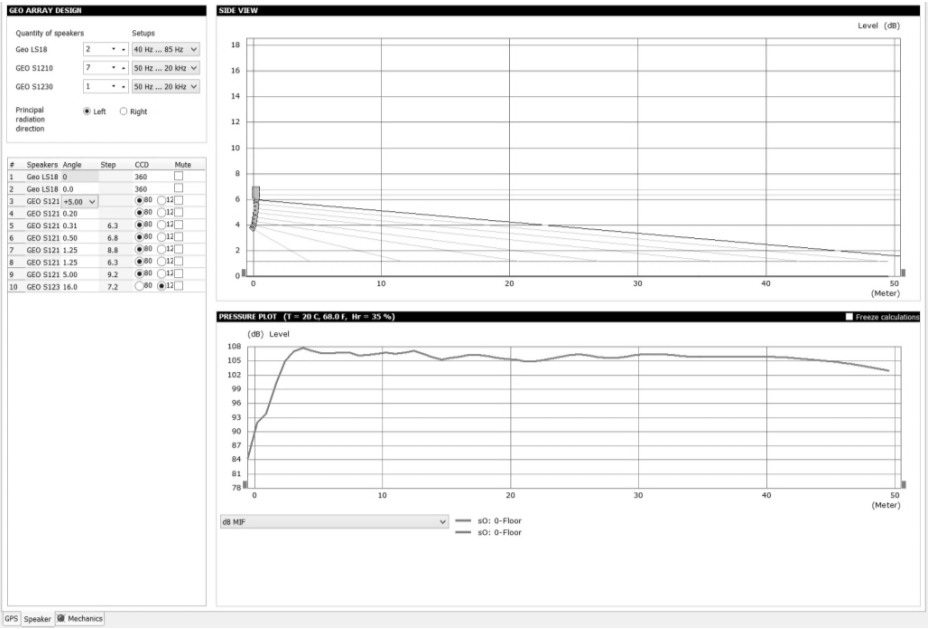
NS-1 installation package includes all NEXO User Manuals, Structural Analysis Reports and Certificates PDF files.

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

IMPORTANT

Never install a GEO S12 EN54 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



NS-1 GEO S12 ACOUSTIC PAGE

6 CONFIGURABLE DIRECTIVITY DEVICE

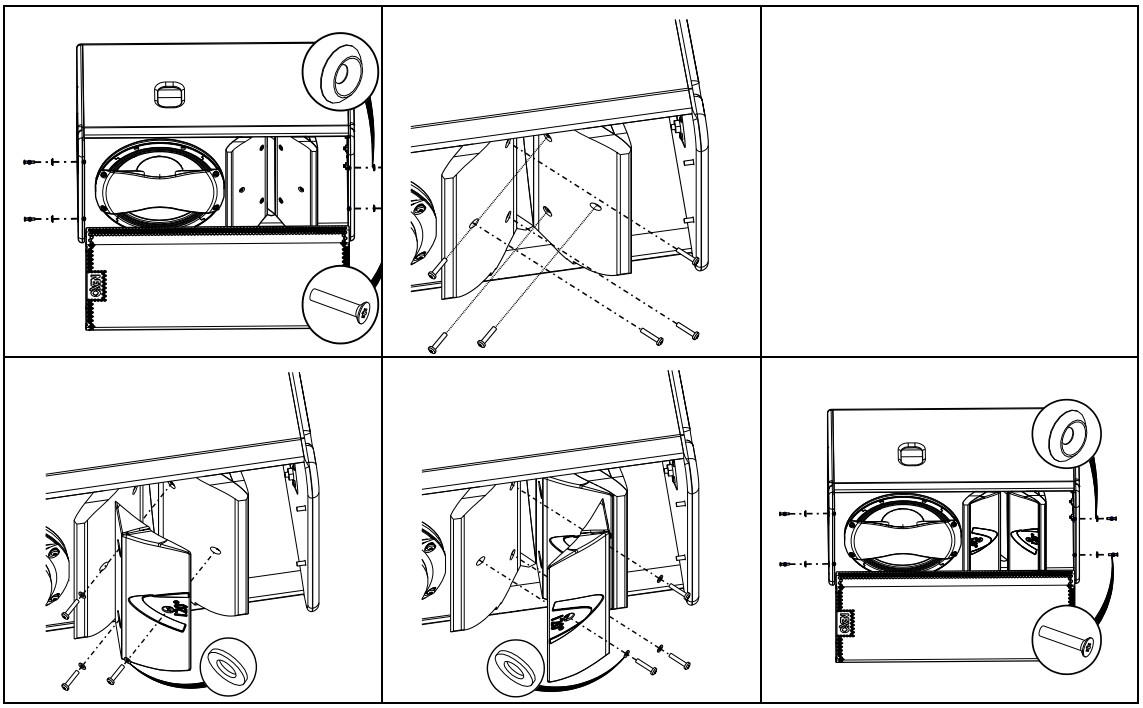
The GEO Wavesource controls dispersion of acoustic energy using a hyperboloid acoustical reflector in the “coupling plane” (the vertical plane of a curved vertical tangent array) and a diffraction slot in the “non-coupling plane” (the horizontal plane of a curved vertical tangent array). The patented Configurable Directivity Device consists of flanges that alter the diffraction slot’s exit flare rate.

6.1 Installing & removing GEO’s Configurable Directivity Devices

GEO S12 EN54 are shipped in the 80° dispersion configuration, 120° CDD™ flanges are an optional accessory (GPT-FLG).

To change horizontal dispersion from 80° to 120° and vice-versa:

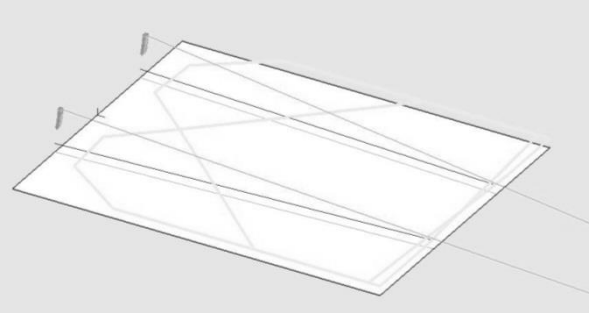
- Remove the front grille
- Remove the 6 screws from the waveguide
- Position the CDD™ flanges on the waveguide and fix it with the provided screws and washers
- Reinstall the grille



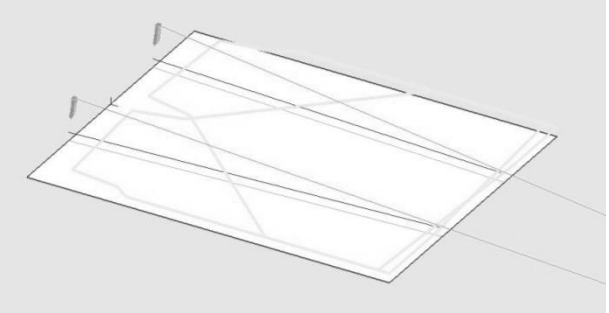
6.2 When & where to use Configurable Directivity flanges

The diagrams show audience area coverage for a stereo system. While the 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 S12 in 80° configuration



-6dB coverage, bottom GEO S12 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°.

IMPORTANT

Installing or removing one of the two flanges anticipating asymmetrical coverage will degrade both coverage and frequency response.

7 GEO S12 EN54 HARDWARE SETUP PROCEDURE

Before proceeding with assembly of GEO S12 EN54 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 S12 EN54 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.

7.1 Safety first

GEO S12 EN54 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 S12 EN54 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 S12 EN54 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 S12 EN54 Rigging System has been optimised for the deployment of curved vertical or horizontal tangent arrays of GEO S12 EN54 loudspeakers. Angle adjustment between cabinets has been limited to specific settings to ensure correct acoustic coupling.

The GEO S12 EN54 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 S12 EN54 Rigging System and provided with suitable safety equipment should deploy GEO Arrays. Misuse of the GEO S12 EN54 Rigging System could lead to dangerous consequences.

Used and maintained correctly, the GEO S12 EN54 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 S12 EN54. 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.

7.1.1 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 S12 EN54 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 S12 EN54 system always wear protective headwear, footwear and eye protection.

Do not allow inexperienced persons to handle a GEO S12 EN54 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 S12 EN54 Rigging System are based on a 1/1.2 factor for hoist or motor acceleration).

NEVER attach any item to the GEO S12 EN54 system other than the GEO S12 EN54 accessories.

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

In case of wind greater than 8 on Beaufort scale (72km/h – 45mph), a touring system has to be landed or an additional securing has to be implanted.

For fixed installations, wind loading has to be taken into account in accordance to the national standards.

The GEO S12 EN54 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 S12 EN54 components carefully to prevent damage in transit.

7.1.2 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 safely 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.

7.1.3 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:

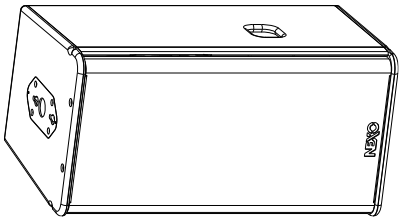
The Production Services Association (PSA),
School Passage,
Kingston-upon-Thames,
KT1 SDU Surrey,
ENGLAND
Telephone: +44 (0) 181 392 0180
www.psa.org.uk/

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

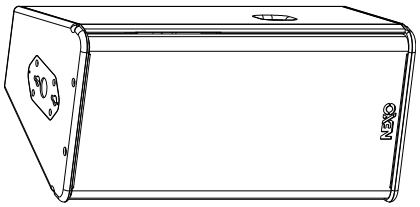
ESTA
Entertainment Services & Technology
Association
875 Sixth Avenue, Suite 1005
NEW YORK, NY 10001 USA
Phone: 212-244-1505
www.esta.org

7.2 General Description

7.2.1 GEO S1210 EN54 and GEO S1230 EN54

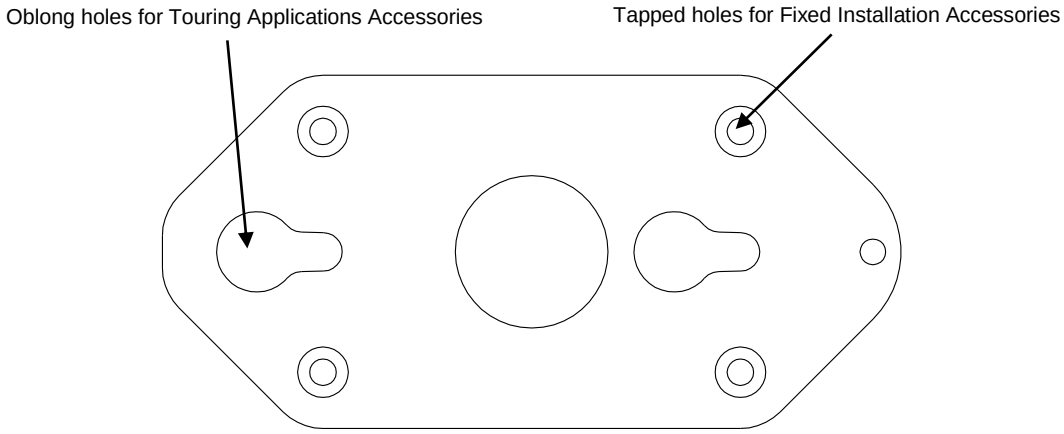


GEO S1210 EN54



GEO S1230 EN54

GEO S1210 EN54 and GEO S1230 EN54 incorporate two connecting plates (one per side) on which a comprehensive range of accessories can be mounted.



GEO S12 EN54 connecting plates

Angle splay setting sequences are as follow:

- GEO S1210 EN54 to GEO S1210 EN54: 0.2° / 0.31° / 0.5° / 0.8° / 1.25° / 2° / 3.15° / 5° / 6.25° / 8° / 10°
- GEO S1210 EN54 to GEO S1230 EN54: 16°
- GEO S1230 EN54 to GEO S1230 EN54: 16° / 22.5° / 30°

7.2.2 GEO S12 EN54 “Left” and “Right” configuration

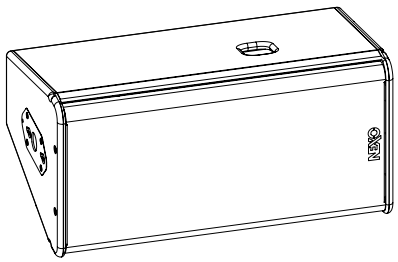
GEO S12 EN54 can be installed “Left” or “Right”:

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

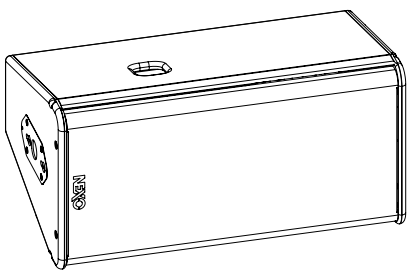
- “Right” means HF waveguide is right as seen from front

GEO S12 EN54 can be connected to bumpers “Left” or “Right” by simply flipping the cabinets.

Whenever possible, NEXO recommends symmetrical designs (preferably HF waveguide inwards in stereo configurations)



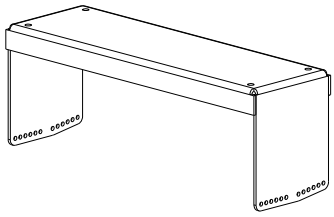
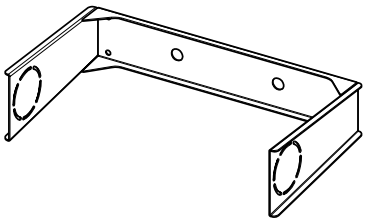
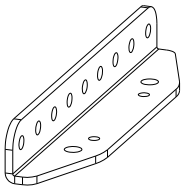
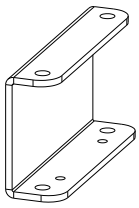
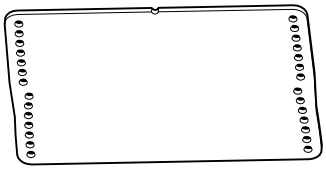
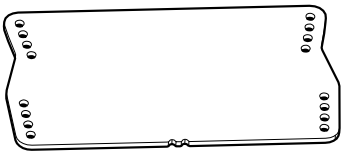
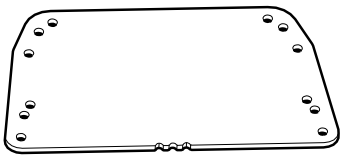
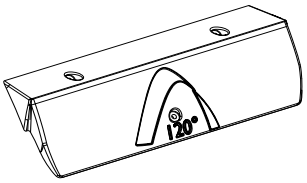
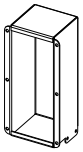
GEO S12 EN54 “Left”



GEO S12 EN54 “Right”

7.2.3 Accessories

GEO S12 EN54 accessories are:

GPI-BUMPER 	VNI-UBRK12 	VNI-LBRK 
VNI-ABRK 	GPI-ANPL1 	GPI-ANPL2 
GPI-ANPL3 	GPT-FLG 	VNI-IPCOV15 

7.2.4 Warnings on GEO S12 EN54 accessories

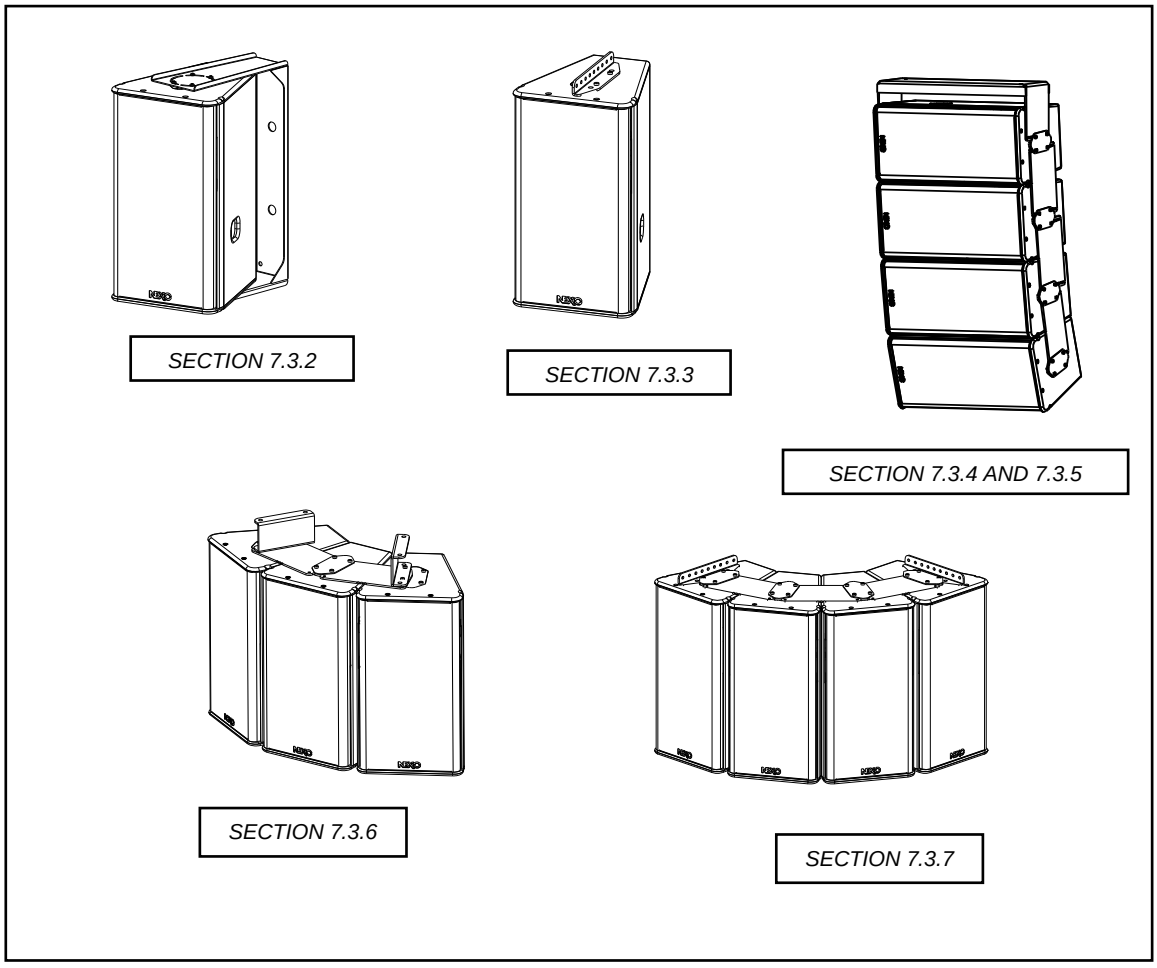
WARNING

All GEO S12 EN54 accessories are specifically rated in agreement with structural computations.

Never use other accessories when assembling GEO S12 EN54 cabinets than the ones provided by NEXO: NEXO will decline responsibility over the entire GEO S12 EN54 accessory range if any component is purchased from different supplier.

7.3 Installation applications

7.3.1 Described configurations



IMPORTANT

In order to prevent screws from getting loose in fixed installations, we deliver thread lock coated screws, if not use blocking liquid LOCTITE™ 243 or equivalent for all screws used with GEO S12 EN54 fixed installation accessories.

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

7.3.2 Single GEO S12 EN54 rigidly mounted on a wall or a ceiling (vertical or horizontal)

Required items

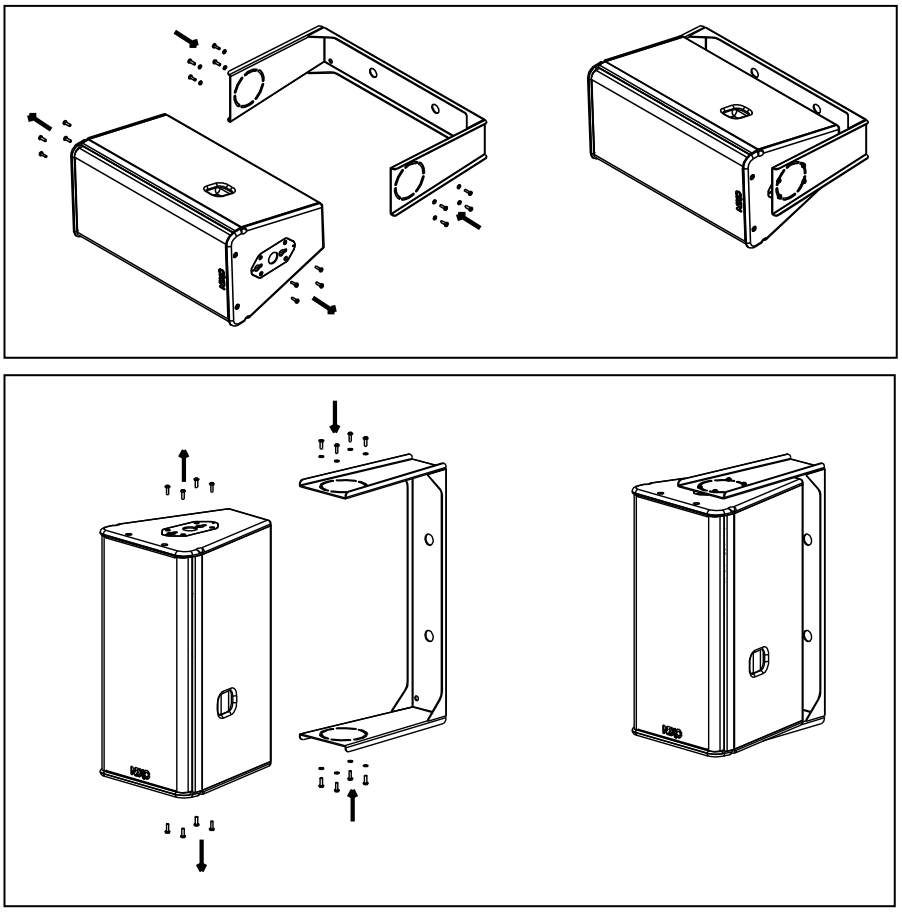
- 1 x VNI-UBRK12 (allows all angles to be implemented)
- 4 x 12mm diameter screws (*not provided*)

IMPORTANT

Ensure that the surface – wall or ceiling – is strong enough to hold 4 times GEO S12 EN54 weight and that the four screws 12mm diameter and corresponding plugs required to fix the "U" bracket on the wall or under the ceiling are properly dimensioned.

Procedure

- Remove the four TORX screws holding connector plates on both sides of GEO S12 EN54
- Position the GEO S12 EN54 inside the "U" Bracket to desired angle; "U" bracket oblong holes must be properly aligned with panels holes
- Apply Loctite 243 or equivalent to the eight screws and washers from VNI-UBRK12 kit
- Connect "U" bracket to cabinet with these screws
- Four screws 12mm diameter (not provided) are required to secure the "U" Bracket on the wall or ceiling



7.3.3 Single GEO S12 EN54 cable mounted on a ceiling (vertical or horizontal)

Required items

- 1 or 2 x VNI-LBRK (allows cable suspension, holes for cable suspension are 10mm diameter)
- 2 or 4 slings and corresponding shackles (*not provided*)

IMPORTANT

Ensure that the ceiling is strong enough to hold 4 times GEO S12 EN54 weight and that the cable suspension system required to install the cabinet under the ceiling is properly dimensioned.

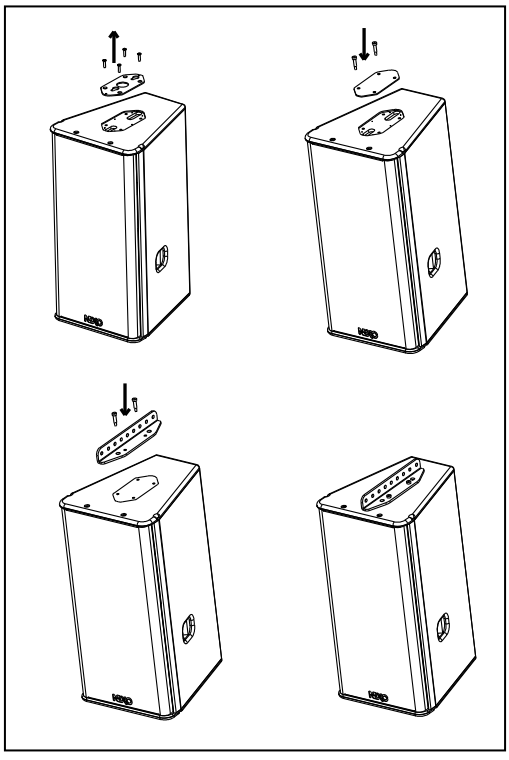
Procedure

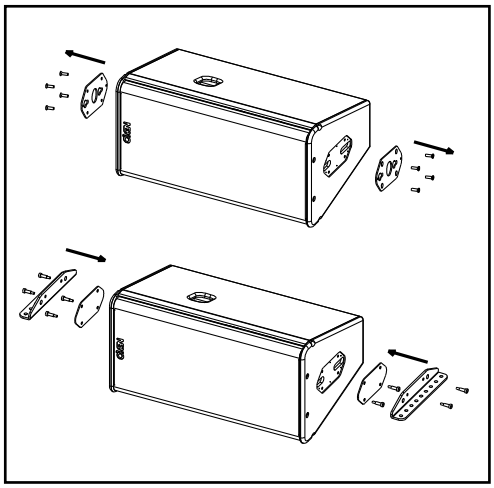
Vertical

- Remove the four TORX screws holding connector plates on upper side of GEO S12 EN54
- Remove the connector plate from GEO S12 EN54
- Apply Loctite 243 or equivalent to the 4 shoulder screws from VNI-LBRK
- Position external plate from VNI-LBRK kit and secure it using the 2 of the 4 shoulder screws
- Position “L” bracket from VNI-LBRK kit, and secure it to the cabinet using the 2 remaining shoulder screws
- Slings and shackles (not provided) are required to secure the cluster under the ceiling

Horizontal

- Remove the four TORX screws holding connector plates on both sides of GEO S12 EN54
- Remove the connector plates from GEO S12 EN54
- Apply Loctite 243 or equivalent to the 4 shoulder screws from VNI-LBRK
- Position external plates from VNI-LBRK kits and secure them using the shoulder screws
- Position “L” brackets from VNI-LBRK kits, and secure them to the cabinet using the 4 remaining shoulder screws
- Slings and shackles (not provided) are required to secure the cluster under the ceiling





7.3.4 GEO S12 EN54 vertical array rigidly mounted on a ceiling

Required items

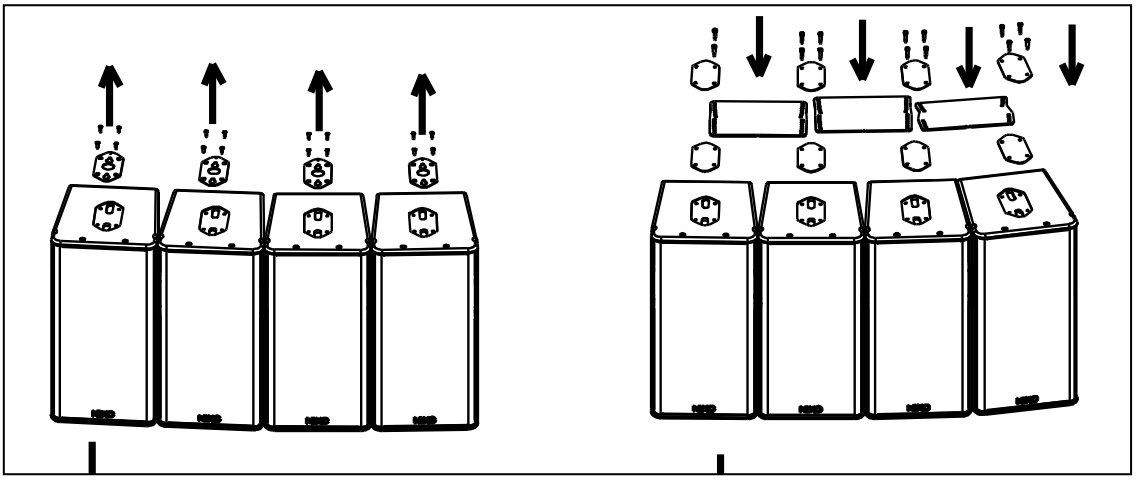
- 1 x GPI-BUMPER (allows +/-5° bumper tilt when installed below a flat surface; if higher bumper tilt is required, surface will have to be defined accordingly)
- (N-1) x GPI-ANPL for a N x GEO S12 EN54 array (ANPL1 ranges from 0.2° to 3.15°, ANPL2 ranges from 5° to 10°, ANPL3 ranges from 16° to 30°)
- 4 x 12mm diameter screws (*not provided*)

IMPORTANT

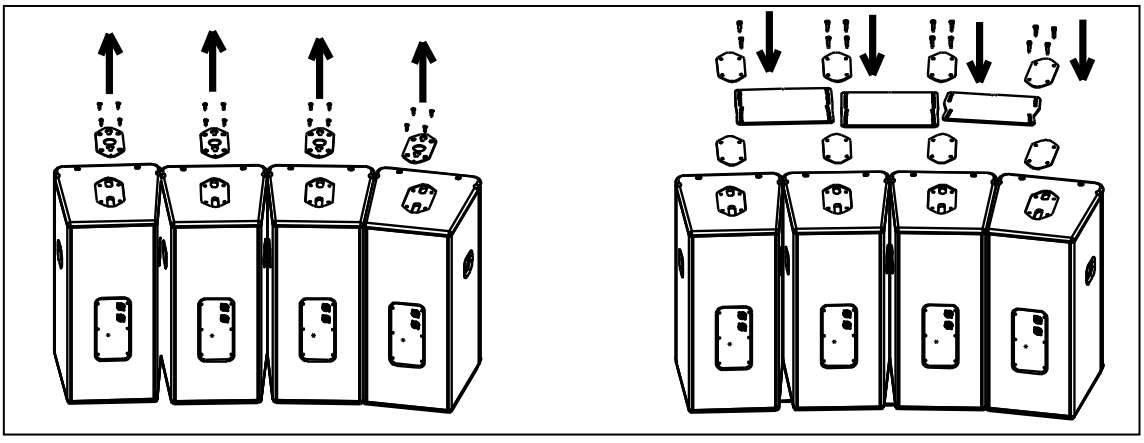
Ensure that the ceiling is strong enough to hold 4 times GEO S12 EN54 cluster weight and that the four screws 12mm diameter and corresponding plugs required to fix the bumper under the ceiling are properly dimensioned.

Procedure

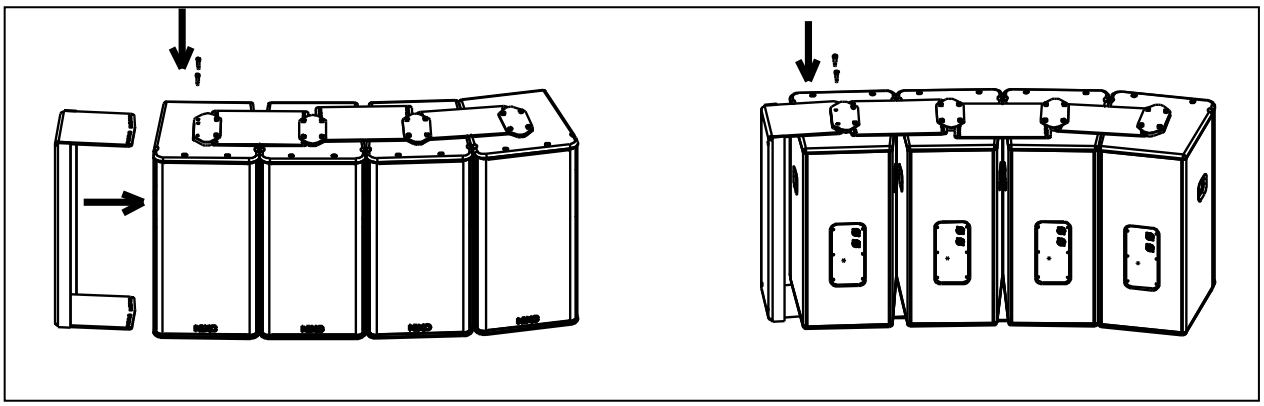
- Set all GEO S12 EN54 sideways according to cluster configuration
- Remove the four TORX screws holding connector plates on upper side of all GEO S12's EN54
- Remove the connector plates from all GEO S12's EN54
- Position bottom counter-plates, angle plates and top counter-plates from GPI-ANPL kit to required inter-cabinet angle value between cabinets upper sides
- Use thread lock coated screws (or if not apply Loctite 243 or equivalent to shoulder screws) from GPI-ANPL kits
- Screw shoulder screws so that all plates and cabinets are tightened together

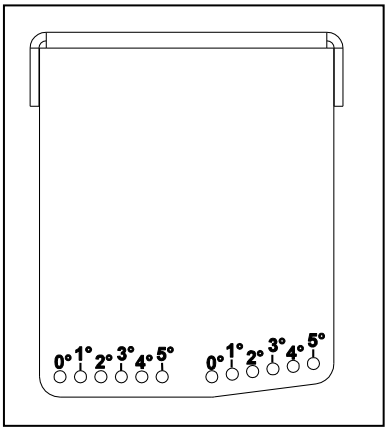


- Flip the cluster upside down to access connector plates located on the down side
- Repeat all above steps

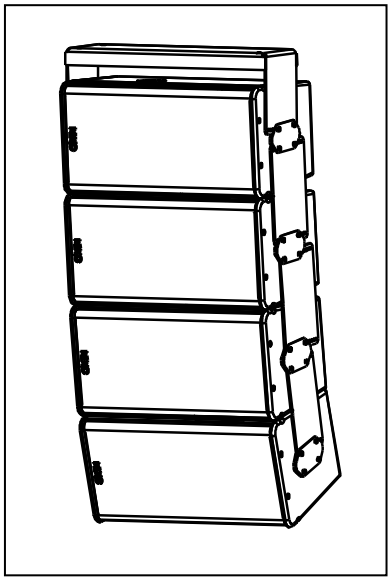


- Use thread lock coated screws (or if not apply Loctite 243 or equivalent to four shoulder screws) from the last GPI-ANPL kit
- Position the GPI-BUMPER bumper to required angle position and use the four shoulder screws to connect it the bumper to the top cabinet





- Flip GEO S12 EN54 cluster by 90° so that it is ready to be positioned under the ceiling
- Four screws 12mm diameter (not provided) are required to secure the bumper under the ceiling



7.3.5 GEO S12 EN54 vertical array cable mounted on a ceiling

Required items

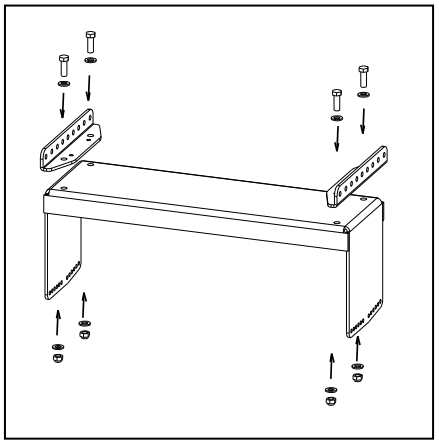
- As in 2 sections above, plus
- 2 x VNI-LBRK (allows cable suspension for bumper, holes for cable suspension are 10mm diameter)
- 4 x slings and shackles (*not provided*)

IMPORTANT

Ensure that the ceiling is strong enough to hold 4 times GEO S12 EN54 cluster weight and that the cables suspension system required to fix the bumper under the ceiling is properly dimensioned.

Procedure

- Connect the bumper and the two “L” brackets using the screws, washers and bolts provided in the VNI-LBRK kit



- Proceed as in preceding sections
- 4 slings and 4 shackles (not provided) are required to secure the cluster under the ceiling

7.3.6 GEO S12 EN54 horizontal array rigidly mounted on a ceiling

Required items

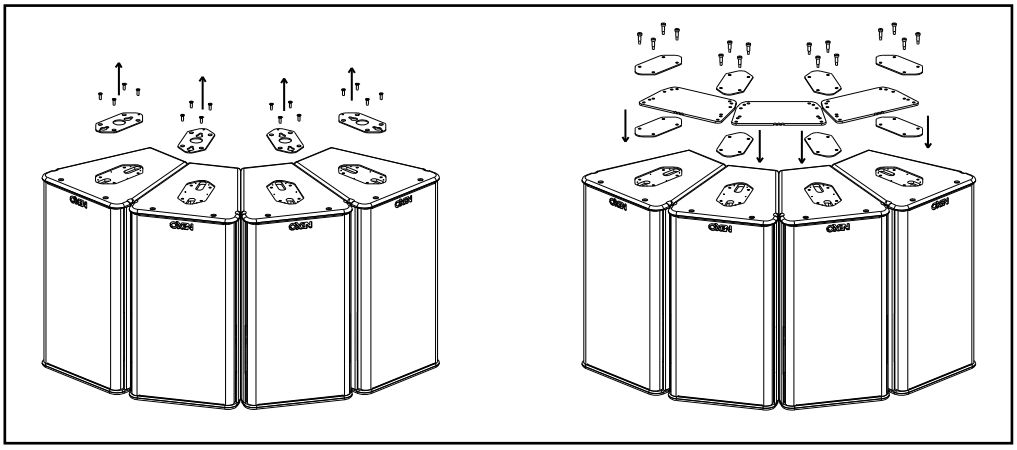
- 2 x VNI-ABRK (allows rigid ceiling suspension for horizontal arrays)
- (N-1) x GPI-ANPL for a N x GEO S12 EN54 array (ANPL1 ranges from 0.2° to 3.15°, ANPL2 ranges from 5° to 10°, ANPL3 ranges from 16° to 30°)
- 4 x 12mm diameter screws (*not provided*)

IMPORTANT

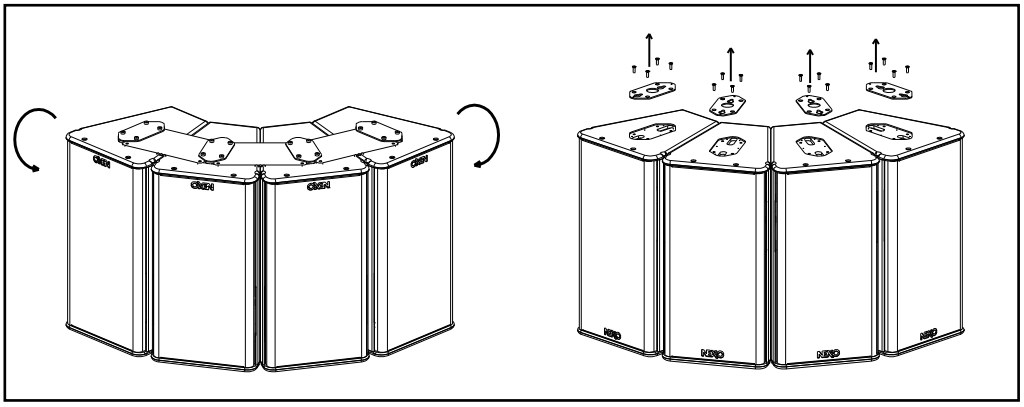
Ensure that the ceiling is strong enough to hold 4 times GEO S12 EN54 cluster weight and that the four screws 12mm diameter and corresponding plugs required to fix the "L" brackets under the ceiling are properly dimensioned.

Procedure

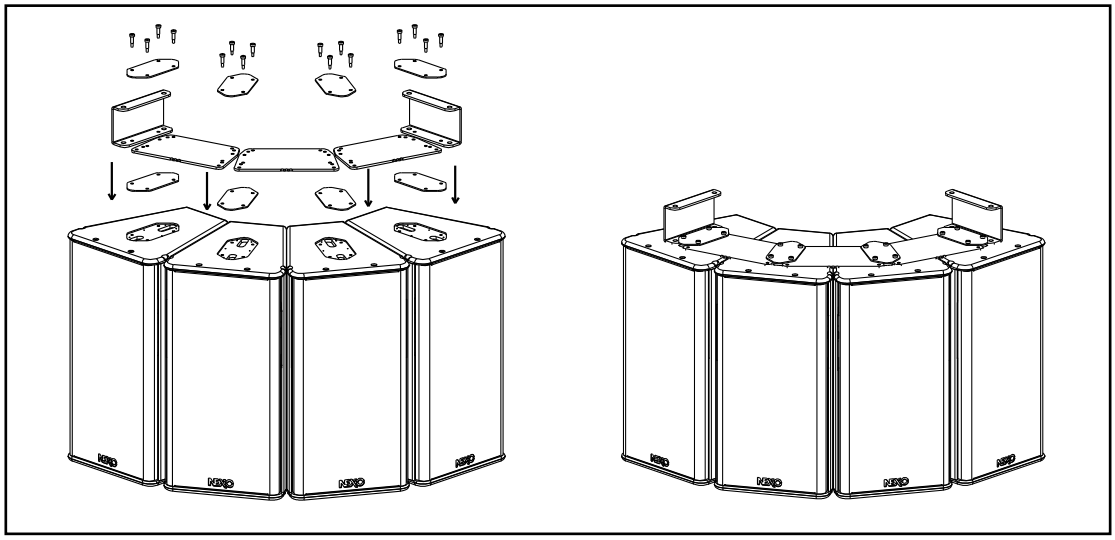
- Set all GEO S12 EN54 side by side
- Remove the four TORX screws holding connector plates on upper side of all GEO S12's EN54
- Remove the connector plates from all Geo S12's EN54
- Position bottom external plates, angle plates and top external plate from GPI-ANPL kits to required inter-cabinet angle value between cabinets upper sides
- Use thread lock coated screws (if not apply Loctite 243 or equivalent to shoulder screws) from GPI-ANPL kits
- Screw all shoulder screws so that all plates and cabinets are tightened together



- Flip the cluster upside down to access connector plates located on the down side
- Repeat all above steps



- Position the two “U” brackets from VNI-ABRK kits on the outer cabinets next the angle plates, and tight them to the cabinets using the shoulder screws provided with these kits (using Loctite 243 or equivalent)
- Four screws 12mm diameter (not provided) are required to secure the “U” brackets under the ceiling



7.3.7 GEO S12 EN54 horizontal array cable mounted on a ceiling

Required items

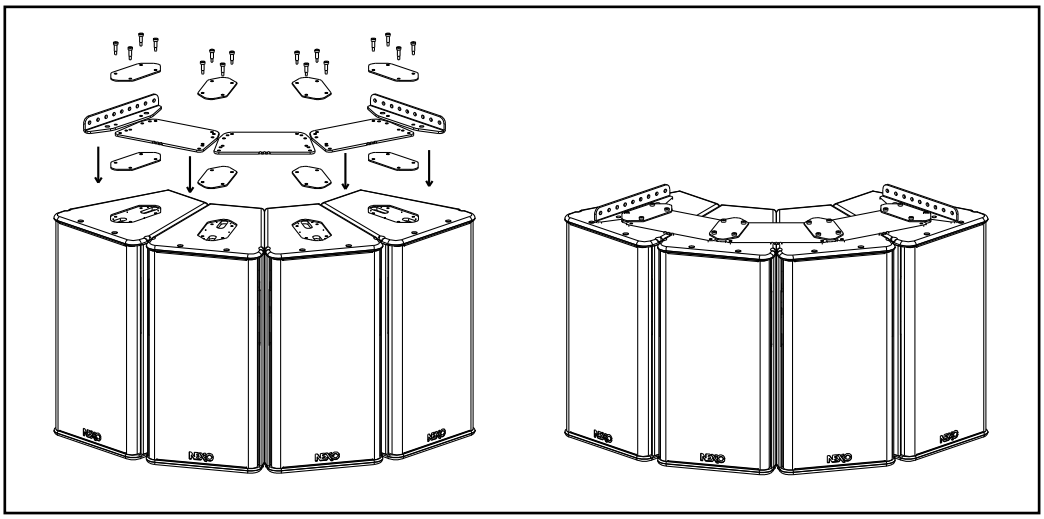
- 2 x VNI-ABRK (allows cable suspension for horizontal arrays, holes for cable suspension are 10mm diameter)
- (N-1) x GPI-ANPL for a N x GEO S12 EN54 array (ANPL1 ranges from 0.2° to 3.15°, ANPL2 ranges from 5° to 10°, ANPL3 ranges from 16° to 30°)
- 4 x slings and 4 shackles (*not provided*)

IMPORTANT

Ensure that the ceiling is strong enough to hold 4 times GEO S12 EN54 cluster weight and that that the cables suspension system required to fix the cluster under the ceiling is properly dimensioned.

Procedure

- Proceed as in above section, VNI-LBRK being positioned on the outer cabinets instead of VNI-ABRK
- 4 slings and 4 shackles (not provided) are required to secure the cluster under the ceiling



7.4 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. 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 GEO S12 EN54 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.

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8 SYSTEM CHECK GUIDELINES

8.1 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 Inclinometer – For measuring vertical and horizontal angles in the venue.

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 (vertical angle in degrees) x 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 x Angle (in degrees)/180

Computer – Laptop or Desktop PC running Windows 8 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 Systune™, Smaart™ 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.

8.2 GEO S12 EN54 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.

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.

Verify that the angle settings are the same on both sides of each module.

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 S12 EN54 are summing properly: 6 dB gain per doubling of quantity.

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 S12s EN54, 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.

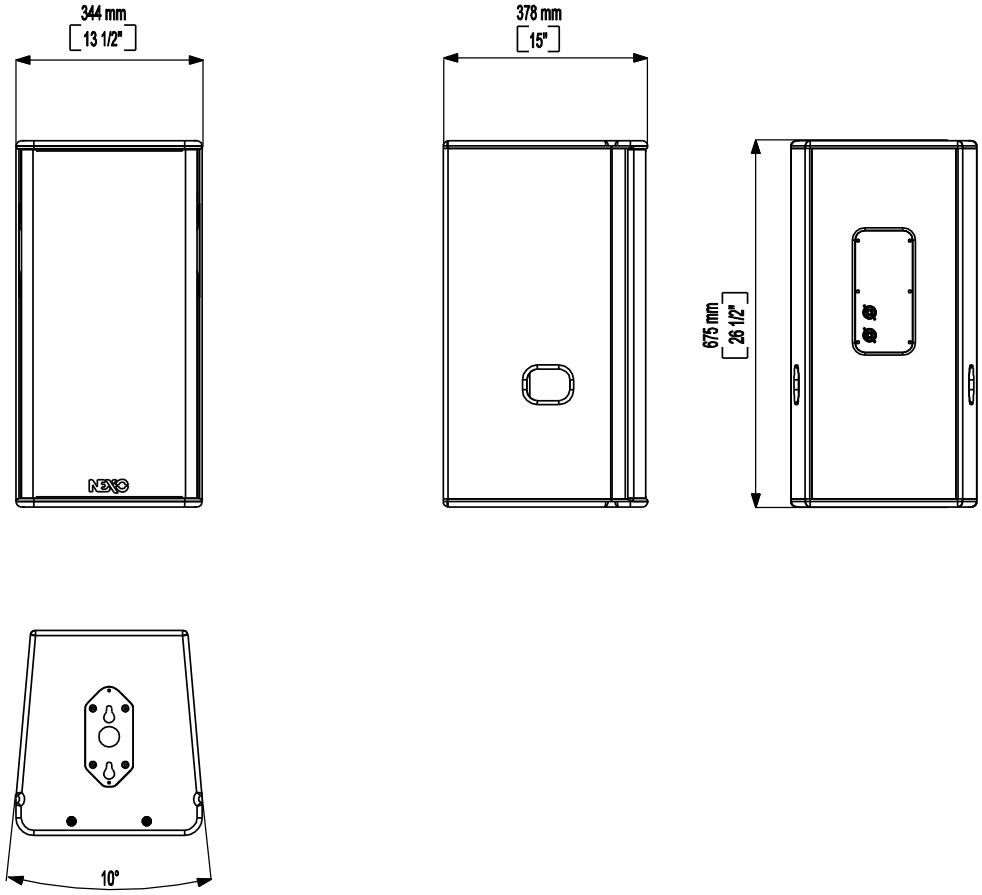
9 TECHNICAL SPECIFICATIONS

9.1 GEO S1210 EN54

9.1.1 System specifications

	GEO S1210 EN54 (without CDD™)	GEO S1210 EN54 (with CDD™)
GEO S1210 EN54 WITH NEXO TDCONTROLLER SETUP		
Frequency Response @-6 dB	50 Hz to 20 kHz	
Sensitivity 1W@4m	88.7 dB SPL	87.5 dB SPL
Peak SPL@4m	108 dB	106.8 dB
Vertical Dispersion	10°	
Horizontal Dispersion	80°	120°
Passive Crossover Frequency	1.1 kHz	
Nominal Impedance	Active mode : (16 Ω LF + 16 Ω HF) / Passive mode : 16 Ω	
Recommended Power	Active mode: (1100 Watts LF + 650 Watts HF) / Passive mode: 1100 Watts	
PRODUCT FEATURES		
LF Component	1 x 12” (30cm) high excursion neodymium 16 Ohm driver with PDD™	
HF Component	1 x 3” voice coil, 1.4” throat 16 Ohms driver on a HR Wavesource™	
Height x Width x Depth	344 mm x 674 mm x 378 mm (13.5” x 26.5” x 14.9”)	
Weight: Net	28 kg (61.8 lb)	
Connectors	2 x NL4, 4 poles connectors (1+/1- Through / 2+/2- GEOS12 in passive mode, 1+/1- LF, 2+/2- HF in active mode)	
Construction	Baltic Birch Plywood with structured black coating	
Fittings	2 x Side handles	
Front Finish	Molded dark grey metal grill	
Operating temperature range	0°C - 40 °C (32° F - 104° F)	
Storage temperature range	-20 °C - 60 °C (-4 ° F - 140° F)	
SYSTEM OPERATION		
Recommended powering solution	NXAMP4x4mk2 Powered TD controller: up to 4 x GEOS12 in passive mode per channel	
Optional powering solution	NXAMP4x2mk2 Powered TD controller: 1 x GEOS12 in passive mode per channel	
	NXAMP4x1mk2 Powered TD controller (Bridged): up to 3 x GEOS12 in passive mode per channel	

9.1.2 Dimensions (mm/inches)

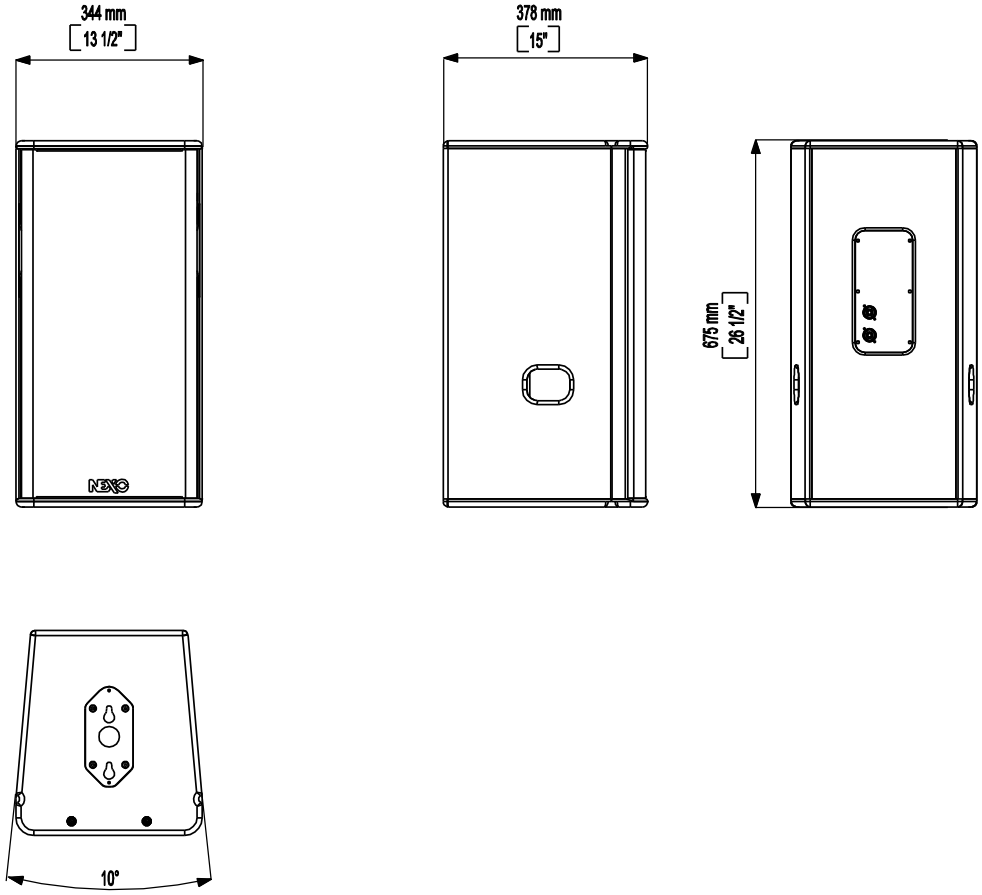


9.2 GEO S1210-ST EN54

9.2.1 System specifications

	GEO S1210-ST EN54 (without CDD™)	GEO S1210-ST EN54 (with CDD™)
GEO S1210-ST EN54 WITH NEXO TDCONTROLLER SETUP		
Frequency Response @-6 dB	50 Hz to 20 kHz	
Sensitivity 1W@4m	89.9 dB SPL	87.6 dB SPL
Peak SPL@4m	109.2 dB	106.9 dB
Vertical Dispersion	10°	
Horizontal Dispersion	80°	120°
Passive Crossover Frequency	1.1 kHz	
Nominal Impedance	Active mode : (16 Ω LF + 16 Ω HF) / Passive mode : 16 Ω	
Recommended Power	Active mode: (1100 Watts LF + 650 Watts HF) / Passive mode: 1100 Watts	
PRODUCT FEATURES		
LF Component	1 x 12” (30cm) high excursion neodymium 16 Ohm driver with PDD™	
HF Component	1 x 3” voice coil, 1.4” throat 16 Ohms Neodymium driver on a HR Wavesource™	
Height x Width x Depth	344 mm x 674 mm x 378 mm (13.5” x 26.5” x 14.9”)	
Weight: Net	28 kg (61.8 lb)	
Connectors	2 x NL4, 4 poles connectors (1+/1- Through / 2+/2- GEOS12 in passive mode, 1+/1- LF, 2+/2- HF in active mode)	
Construction	Baltic Birch Plywood with structured black coating	
Fittings	2 x Side handles	
Front Finish	Molded dark grey metal grill	
Operating temperature range	0°C - 40 °C (32° F - 104° F)	
Storage temperature range	-20 °C - 60 °C (-4 ° F - 140° F)	
SYSTEM OPERATION		
Recommended powering solution	NXAMP4x4mk2 Powered TD controller: up to 4 x GEOS12 in passive mode per channel	
Optional powering solution	NXAMP4x2mk2 Powered TD controller: 1 x GEOS12 in passive mode per channel	
	NXAMP4x1mk2 Powered TD controller (Bridged): up to 3 x GEOS12 in passive mode per channel	

9.2.2 Dimensions (mm/inches)

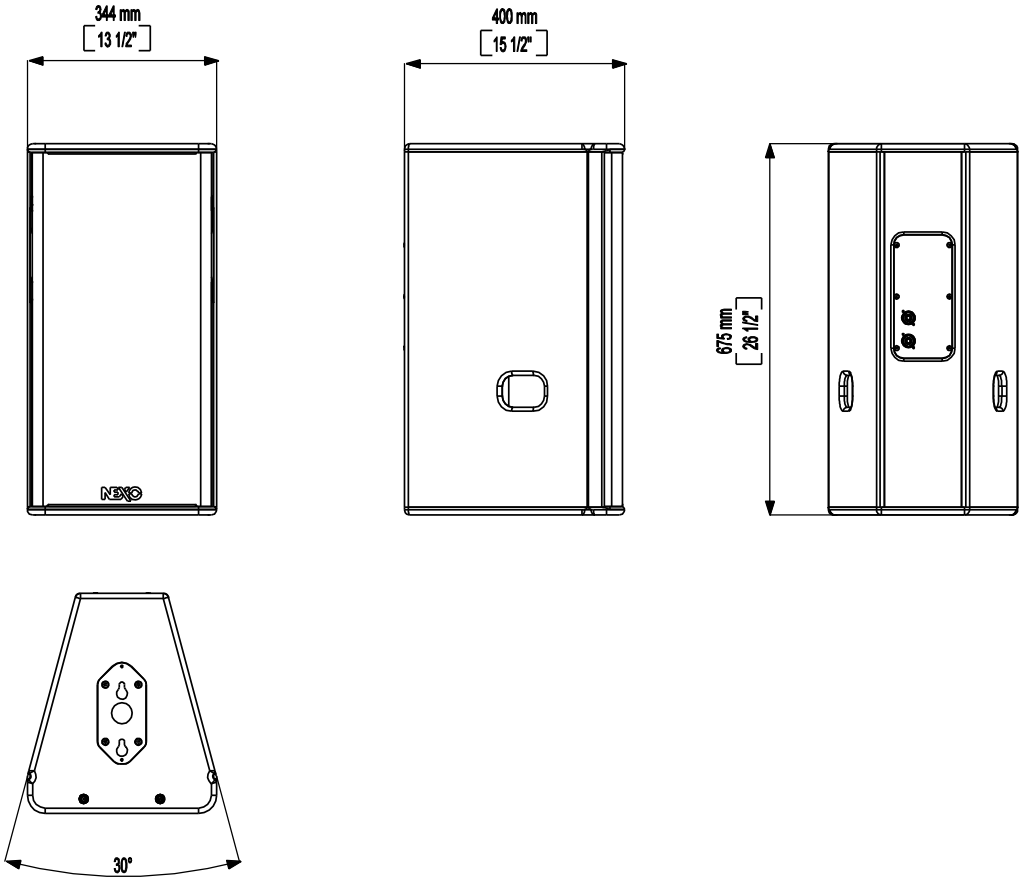


9.3 GEO S1230 EN54

9.3.1 System specifications

	GEO S1230 EN54 (without CDD™)	GEO S1230 EN54 (with CDD™)
GEO S1230 EN54 WITH NEXO TDCONTROLLER SETUP		
Frequency Response @-6 dB	50 Hz to 20 kHz	
Sensitivity 1W@4m	86.8 dB SPL	85.6 dB SPL
Peak SPL@4m	106.1 dB	104.9 dB
Vertical Dispersion	28.5°	
Horizontal Dispersion	80°	120°
Passive Crossover Frequency	1.1 kHz	
Nominal Impedance	Active mode : (16 Ω LF + 16 Ω HF) / Passive mode : 16 Ω	
Recommended Power	Active mode: (1100 Watts LF + 650 Watts HF) / Passive mode: 1100 Watts	
PRODUCT FEATURES		
LF Component	1 x 12” (30cm) high excursion neodymium 16 Ohm driver with PDD™	
HF Component	1 x 3” voice coil, 1.4” throat 16 Ohms driver on a HR Wavesource™	
Height x Width x Depth	344 mm x 675 mm x 400 mm (13.5” x 26.6” x 15.7”)	
Weight: Net	27 kg (59.1 lb)	
Connectors	2 x NL4, 4 poles connectors (1+/1- Through / 2+/2- GEOS12 in passive mode, 1+/1- LF, 2+/2- HF in active mode)	
Construction	Baltic Birch Plywood with structured black coating	
Fittings	2 x Side handles	
Front Finish	Molded dark grey metal grill	
Operating temperature range	0°C - 40 °C (32° F - 104° F)	
Storage temperature range	-20 °C - 60 °C (-4 ° F - 140° F)	
SYSTEM OPERATION		
Recommended powering solution	NXAMP4x4mk2 Powered TD controller: up to 4 x GEOS12 in passive mode per channel	
Optional powering solution	NXAMP4x2mk2 Powered TD controller: 1 x GEOS12 in passive mode per channel	
	NXAMP4x1mk2 Powered TD controller (Bridged): up to 3 x GEOS12 in passive mode per channel	

9.3.2 Dimensions (mm/inches)

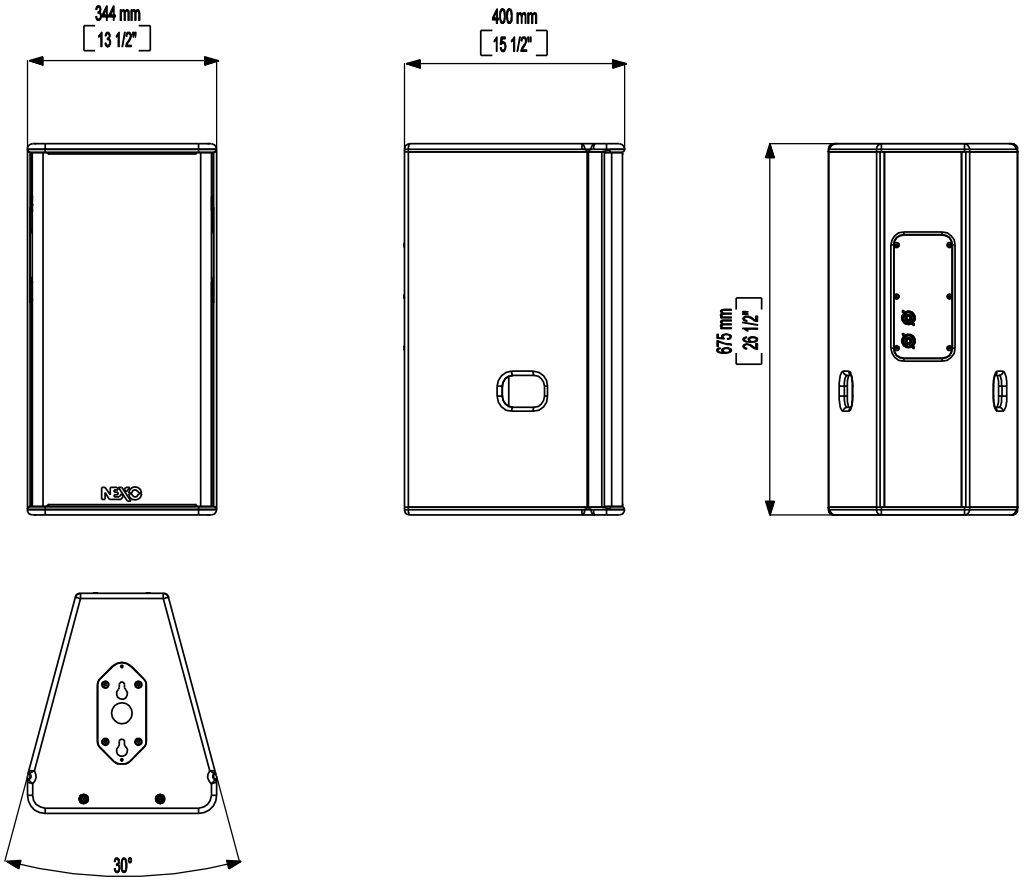


9.4 GEO S1230-ST EN54

9.4.1 System specifications

	GEO S1230-ST EN54 (without CDD™)	GEO S1230-ST EN54 (with CDD™)
GEO S1230-ST EN54 WITH NEXO TDCONTROLLER SETUP		
Frequency Response @-6 dB	50 Hz to 20 kHz	
Sensitivity 1W@4m	88.2 dB SPL	87 dB SPL
Peak SPL@4m	107.5 dB	106.3 dB
Vertical Dispersion	28.5°	
Horizontal Dispersion	80°	120°
Passive Crossover Frequency	1.1 kHz	
Nominal Impedance	Active mode : (16 Ω LF + 16 Ω HF) / Passive mode : 16 Ω	
Recommended Power	Active mode: (1100 Watts LF + 650 Watts HF) / Passive mode: 1100 Watts	
PRODUCT FEATURES		
LF Component	1 x 12” (30cm) high excursion neodymium 16 Ohm driver with PDD™	
HF Component	1 x 3” voice coil, 1.4” throat 16 Ohms Neodymium driver on a HR Wavesource™	
Height x Width x Depth	344 mm x 675 mm x 400 mm (13.5” x 26.6” x 15.7”)	
Weight: Net	27 kg (59.1 lb)	
Connectors	2 x NL4, 4 poles connectors (1+/1- Through / 2+/2- GEOS12 in passive mode, 1+/1- LF, 2+/2- HF in active mode)	
Construction	Baltic Birch Plywood with structured black coating	
Fittings	2 x Side handles	
Front Finish	Molded dark grey metal grill	
Operating temperature range	0°C - 40 °C (32° F - 104° F)	
Storage temperature range	-20 °C - 60 °C (-4 ° F - 140° F)	
SYSTEM OPERATION		
Recommended powering solution	NXAMP4x4mk2 Powered TD controller: up to 4 x GEOS12 in passive mode per channel	
Optional powering solution	NXAMP4x2mk2 Powered TD controller: 1 x GEOS12 in passive mode per channel	
	NXAMP4x1mk2 Powered TD controller (Bridged): up to 3 x GEOS12 in passive mode per channel	

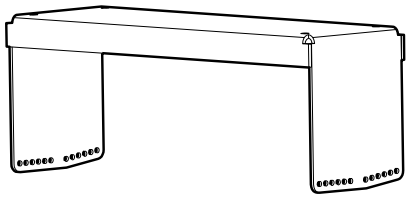
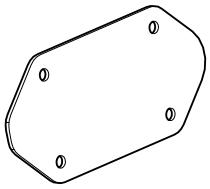
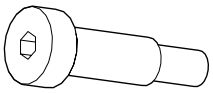
9.4.2 Dimensions (mm/inches)



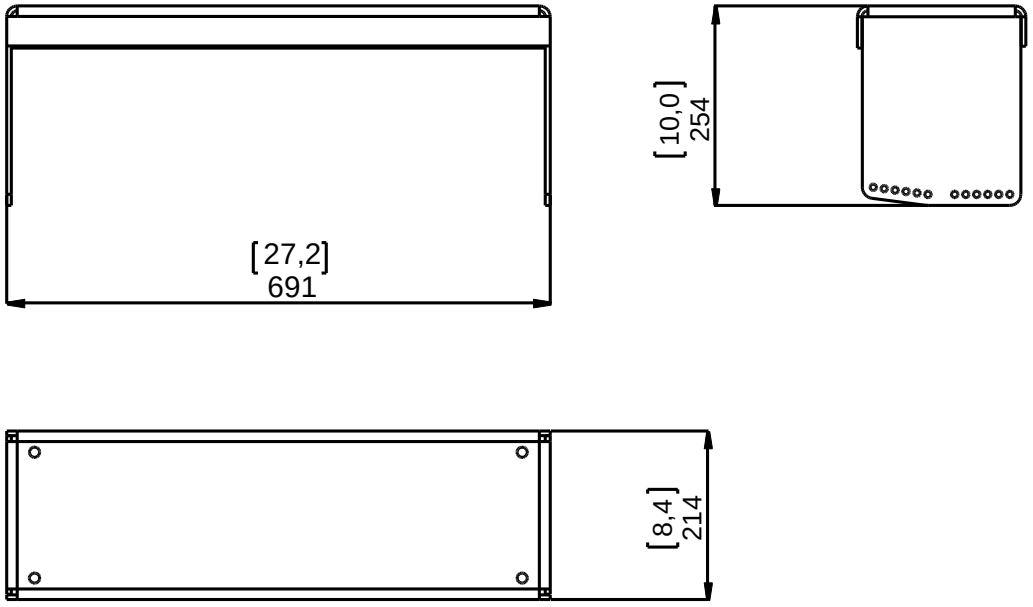
9.5 GEO S12 EN54 accessories

9.5.1 GPI-BUMPER

Parts

X1	X4	X8 (D8x20 M6)
		

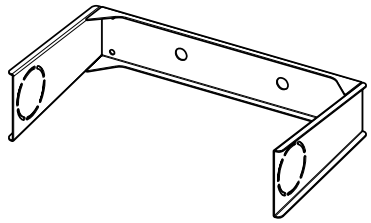
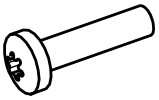
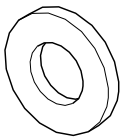
Dimensions



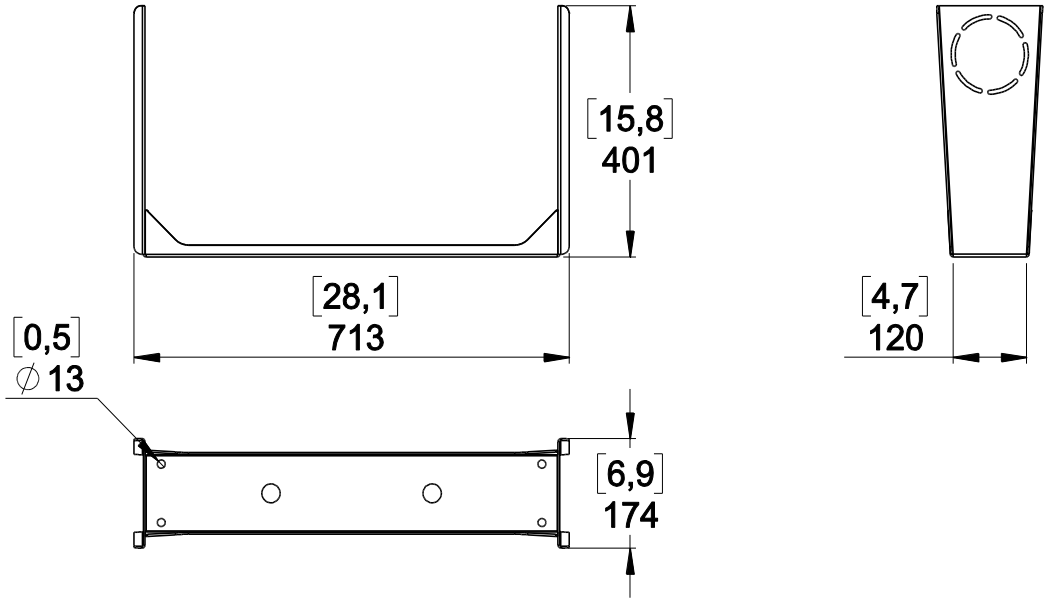
Weight: 14.5 kg / 32 lb

9.5.2 VNI-UBRK12

Parts

X1	X8	X8
		

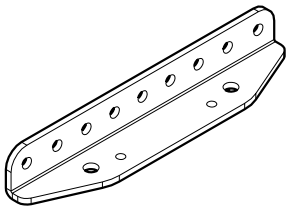
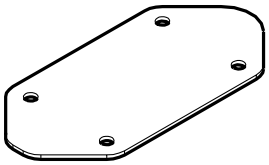
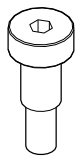
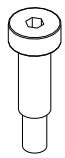
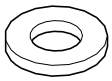
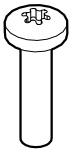
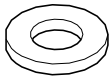
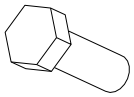
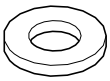
Dimensions



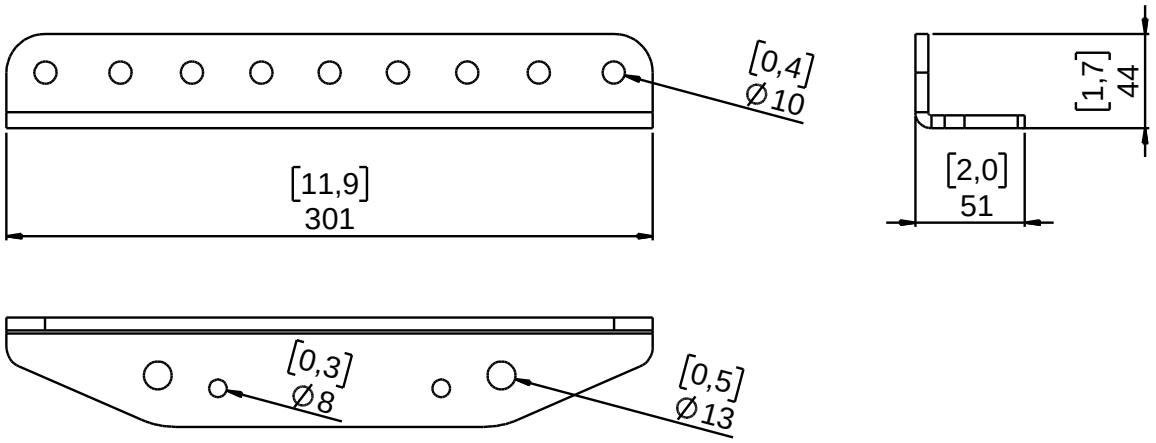
Weight: 6 kg / 13 lb

9.5.3 VNI-LBRK

Parts

X1 		**X1** 		**X2 (D8x12)** 	**X2 (D8x20)** 
X2 (M8) 	**X2 (M6x25)** 	**X2 (M6)** 	**X2 (M12x35)** 	**X4 (M12)** 	**X2 (M12)** 

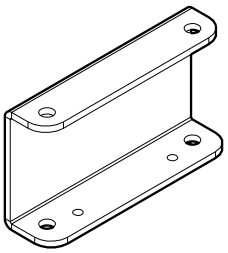
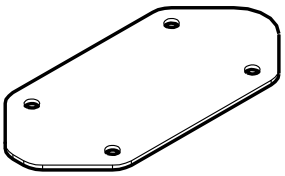
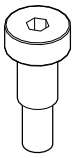
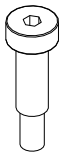
Dimensions

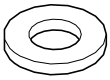
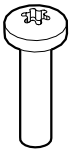
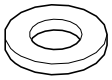
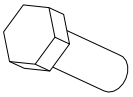
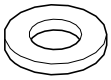


Weight: 1.6 kg / 3.5 lb

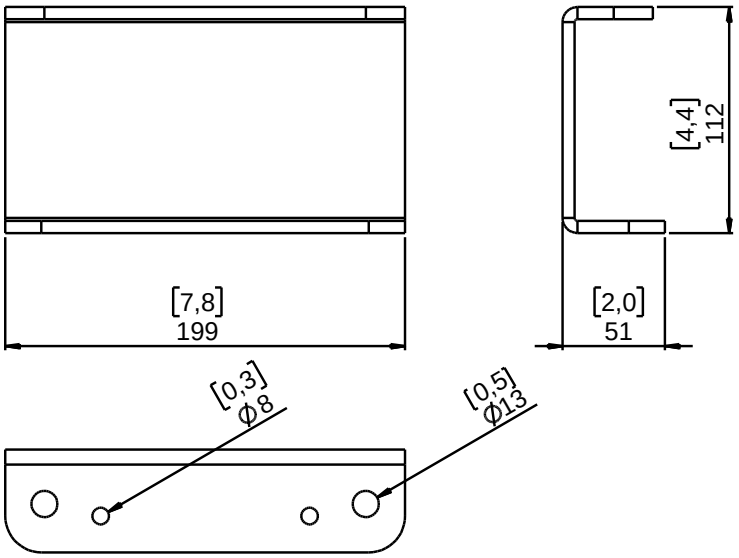
9.5.4 VNI-ABRK

Parts

X1	X1	X2 (D8x12)	X2 (D8x20)
			

X2 (M8)	X2 (M6x25)	X2 (M6)	X2 (M12x35)	X2 (M12)	X2 (M12)
					

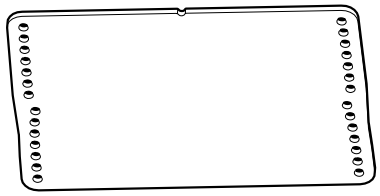
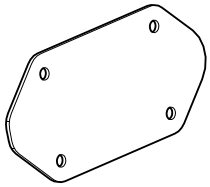
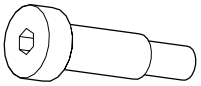
Dimensions



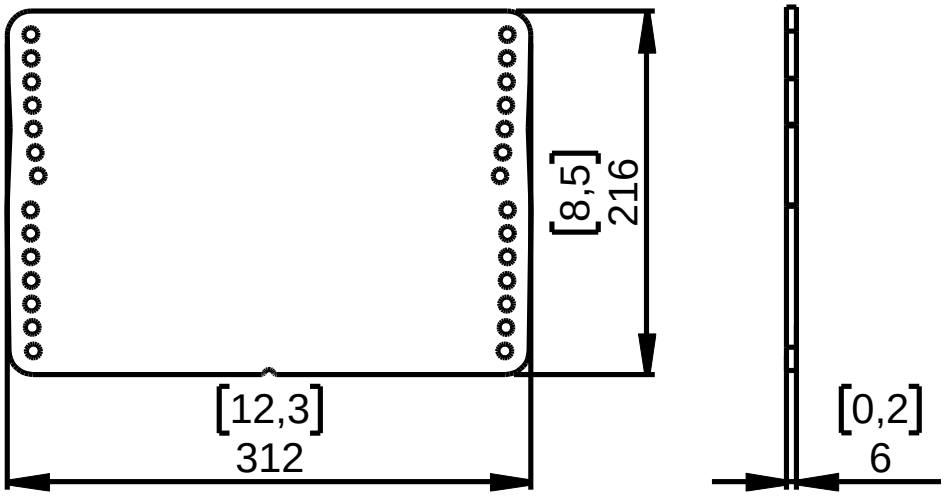
Weight: 1 kg / 2.2 lb

9.5.5 GPI-ANPL1

Parts

X2	X4	X8 (D8x20 M6)
		

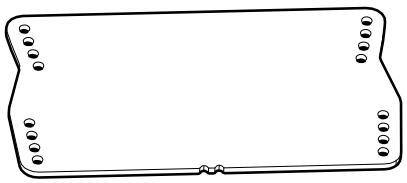
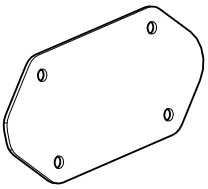
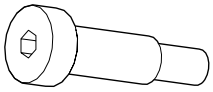
Dimensions



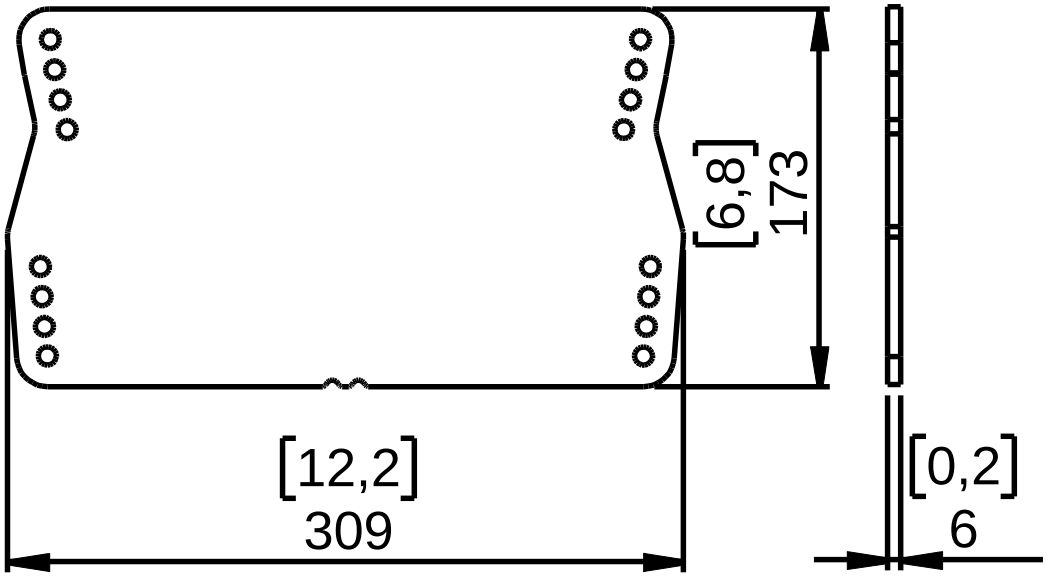
Weight: 8 kg / 17.6 lb

9.5.6 GPI-ANPL2

Parts

X2	X4	X8 (D8x20 M6)
		

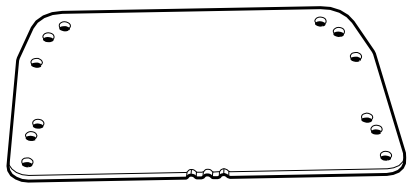
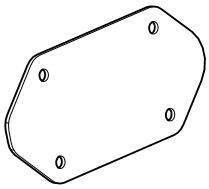
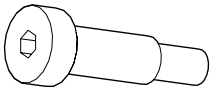
Dimensions



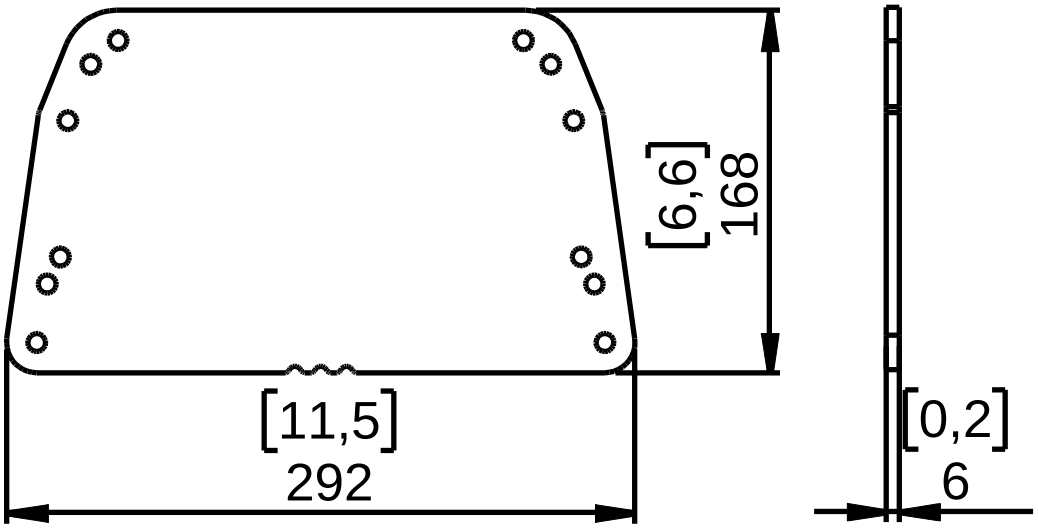
Weight: 6.5 kg / 14.3 lb

9.5.7 GPI-ANL3

Parts

X2	X4	X8 (D8x20 M6)
		

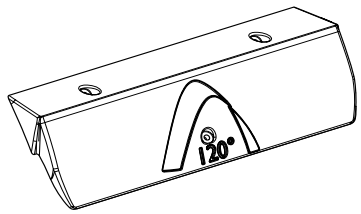
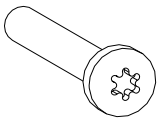
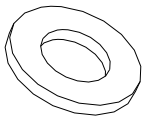
Dimensions



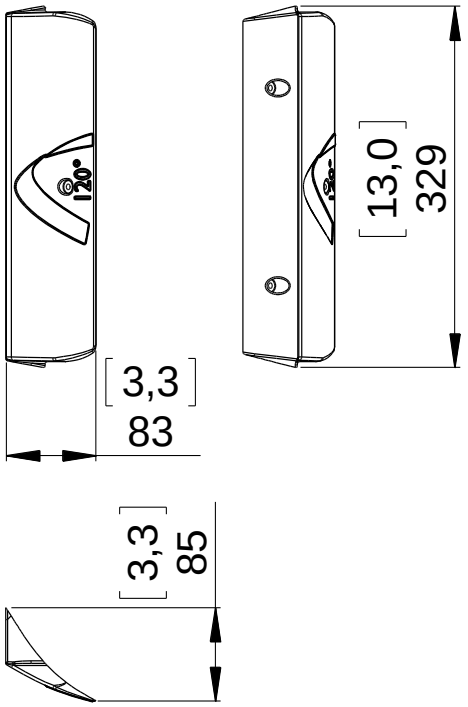
Weight: 6.6 kg / 14.6 lb

9.5.8 GPT-FLG

Parts

X2	X6	X6
		

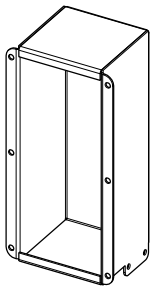
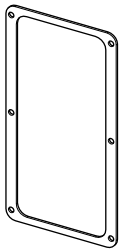
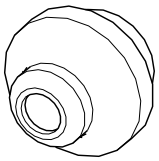
Dimensions



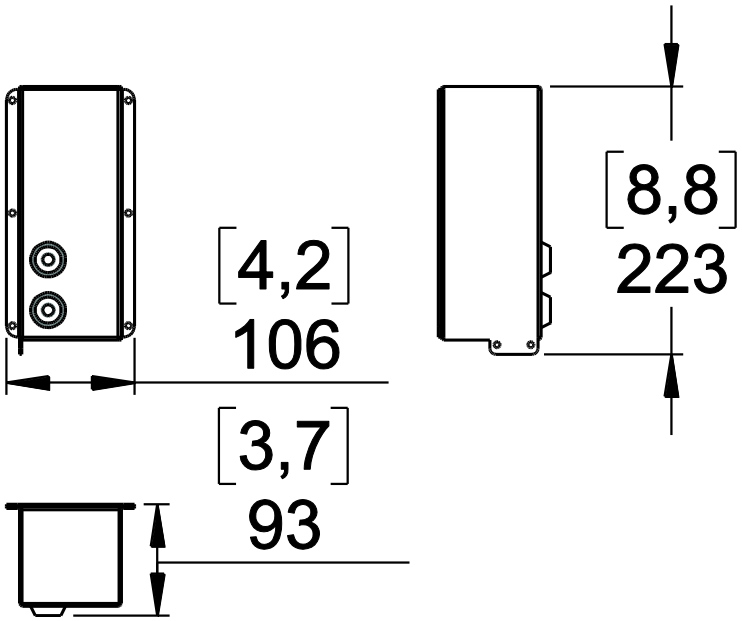
Weight: 0.6 kg / 1.3 lb

9.5.9 VNI-IPCOV15

Parts

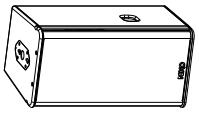
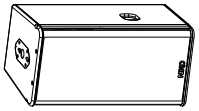
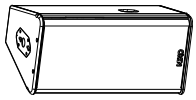
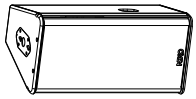
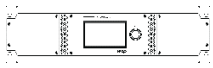
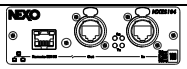
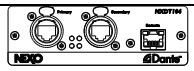
X1	X1	X2
		

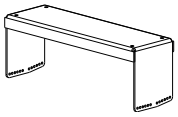
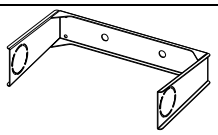
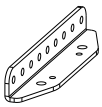
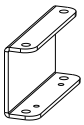
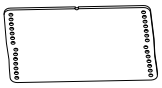
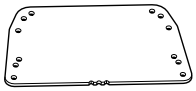
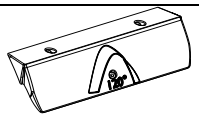
Dimensions



Weight: 0.9 kg / 2 lb

10 GEO S12 EN54 MODULES & ACCESSORIES LIST

REFERENCE	DRAWING	DESCRIPTION
GEO S1210 EN54		12” - 10° Tangent Array
GEO S1210-ST EN54		12” - 10° Tangent Array – Long Throw version
GEO S1230 EN54		12” - 30° Tangent Array
GEO S1230-ST EN54		12” - 30° Tangent Array – Long Throw version
NXAMP4x1mk2		Powered Digital TD Controller 4x1300W
NXAMP4x2mk2		Powered Digital TD Controller 4x2500W
NXAMP4x4mk2		Powered Digital TD Controller 4x4500W
NX.ES104		Ethersound Network Card for NXAMP
NX.DT104MK2		Dante Network Card for NXAMP
NX.AE104		AES Card for NXAMP

REFERENCE	DRAWING	DESCRIPTION
GPI-BUMPER		Installation bumper for GEO S12 EN54
VNI-UBRK12		“U” bracket for GEO S12 EN54
VNI-LBRK		Mounting plate for GEO S12 EN54 and GPI-BUMPER
VNI-ABRK		Mounting plate for GEO S12 EN54 and GPI-BUMPER
GPI-ANPL1		GEO S12 EN54 Angle plate (0.2° to 3.15°)
GPI-ANPL2		GEO S12 EN54 Angle plate (5° to 10°)
GPI-ANPL3		GEO S12 EN54 Angle plate (16° to 30°)
GPT-FLG		Kit flange 120° horizontal dispersion for GEO S12 EN54
VNI-IPCOV15		GEO S12 EN54 IP54 Connector box (included)

11 USER NOTES

NEXO S.A.

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