GEO S8

The ultimate listening experience for the smaller audience

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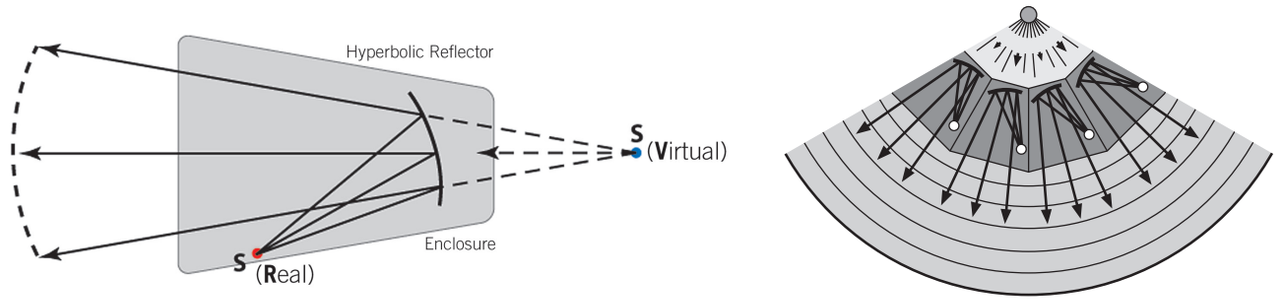
NEXO

GEO S8 & GEO SUB

Patented technologies for greater system accuracy



GEO S8 HF waveguide features a precision–engineered hyperboloid acoustic mirror to create a virtual wavesource located outside the cabinet. Because the path lengths from the virtual and real sources to the horn mouths are identical, wavefronts are perfectly in phase at their coupling points

NEXO S.A.

NEXO is a world leader in the design and manufacture of loudspeaker systems for sound reinforcement. In its fourth decade, NEXO's corporate mission remains development of wide-ranging solutions to enhance the science, art and commerce of sound reinforcement. Founded by President Michael Johnson, and NEXO's Chairman/R&D Director Eric Vincenot, NEXO-SA became publicly traded in May 2000 and listed on the Marche Libre of the Paris Bourse (SICOVAM 4441).

The added access to capital markets gained by this public offering strengthened NEXO's ability to pursue aggressively genuine audio innovations. The fi rst of these advanced audio design options is the widely heralded GEO Tangent technology, which incorporates several fundamental wavesource patents. NEXO's sound reinforcement systems also include the compact, versatile PS Series plus the high performance Alpha System and Alphae Series.

In short, all NEXO loudspeakers, analogue and digital controllers, power amplifi cation, and advanced rigging systems are designed to deliver: Sonic Innovation That Works.

NEXO Geo systems incorporate a number of patented technologies to achieve exceptional accuracy, consistent frequency and SPL coverage throughout the audience, and close correlation between mathematical predictions and real-world results.

To achieve coherency in a line array, multiple cabinets must behave as if they share a single sound source. Geo systems use NEXO's groundbreaking Hyperboloid Reflective Wavesource (HRW™) technology to ensure that wavesources couple optimally without destructive interference.

The HRW controls acoustic energy with a precision–engineered hyperboloid acoustic mirror, creating a virtual wavesource located outside the cabinet.

Because the path lengths from the virtual and real sources to the horn mouths are identical, wavefronts are perfectly in phase at their coupling points – regardless of where the real sources are located in relation to the coupling point.

Configurable Directivity Device Flanges provide system designers with an unprecedented degree of control over wavesource behaviour.

The revolutionary NEXO Directivity Phase Device cleverly extends the upper frequency limit for line source coupling between adjacent woofers.

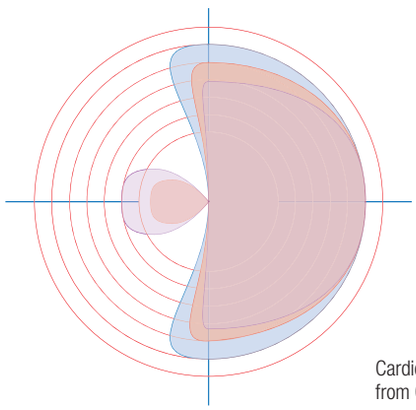
In permanent installations, Geo D and Geo S systems ship with Configurable Directivity Device Flanges, providing system designers with an unprecedented degree of control over wavesource behaviour. CDD flanges can be easily introduced into the waveguides – for instance on the bottom two cabinets of curved vertical arrays to fill in coverage gaps in the front rows, or in all cabinets where 120 degrees of horizontal coverage is preferred to 80 degrees. In horizontal arrays, CDD flanges can be used to widen vertical coverage from 80 degrees to 120 degrees.

In line arrays, the physical diameter of cone drivers would appear to make it impossible to achieve interference-free, close coupling of wavesources at the frequencies necessary to crossover with HF drivers. NEXO's revolutionary Directivity Phase Device causes an 8 inch driver, for instance, to behave as twin 4 inch drivers, with two acoustical centres spaced 5 inches apart, cleverly extending the upper frequency limit for line source coupling between adjacent woofers.

Geo rigging systems deliver control over angular splay to an increment of 0.01 degree, making it possible to configure line arrays of exceptional accuracy and coherence.

The Sub-Bass Solution

NEXO looks towards microphone design to achieve directional control of sub-bass frequencies, applying the interference between two sources of identical amplitude to radiate a cardioid polar pattern with off-axis control. The NX TDcontroller platform maximises subbass pattern control for the CD12 cabinet.



Cardioid Sub-Bass coverage from CD SubBass

GEO S805

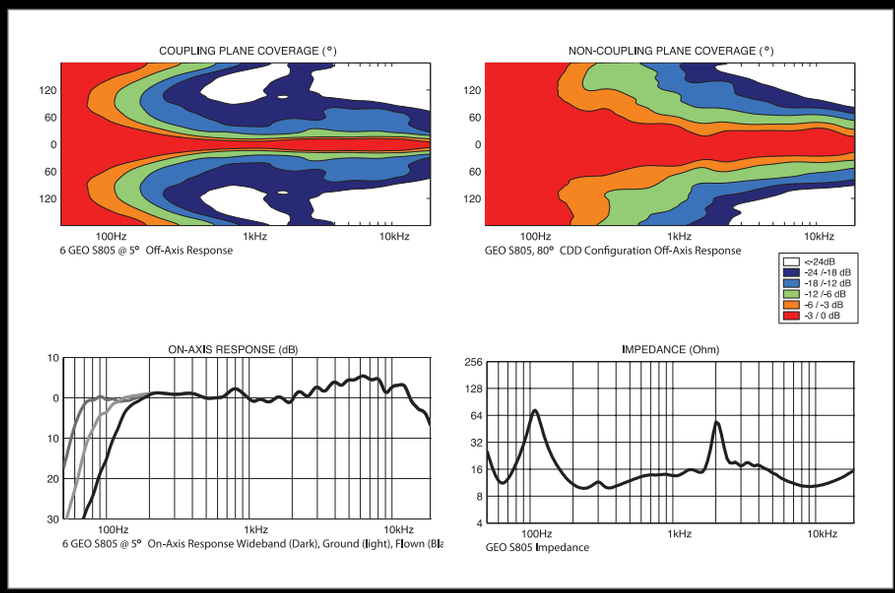
Rear view

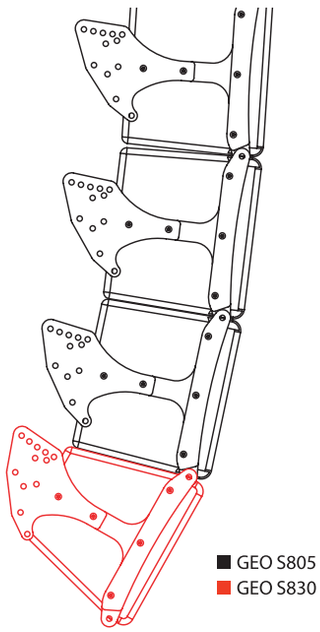
Front/Side view

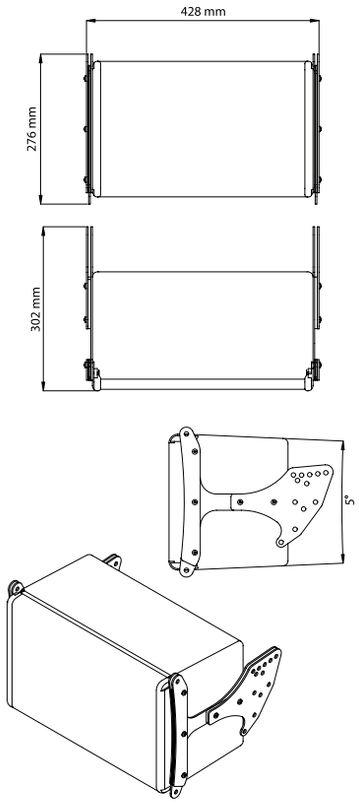
The GEO S805 is compact, high-output array module designed for use in vertical tangent arrays. The Hyperboloid Reflective Wavesource allows multiple GEO S8 loudspeakers to radiate tangent wavefronts with coherent output.

The 5° wavesource is optimized for the construction of curved vertical arrays that deliver equal power to equal coverage areas for consistent SPL from front to rear of the audience area.

Advanced DSP algorithms, applied by the NXAMP/NX242 TDcontroller, precisely integrate GEO S systems with CD12 SubBass cabinets, so they may be flown together, without causing any interference between the GEO S and CD12 wavefronts.







Specifications

GEO S805 PRODUCT FEATURES

Components	LF 1x 8" (20cm) Neodymium Hi-flux 16Ω Driver HF: 1x 1" Throat Neodymium Driver on a Hyperboloid Reflective Wavesource
Height x Width x Depth	406 x 250 x 219mm (16" x 9 7/8" x 5 5/8")
Shape	5° Trapezoid
Weight	13kg (28.6lbs) net
Connectors	2x NL4MP 4-pole SPEAKON (In & Through)
Construction	Baltic Birch Ply finish with structured black coating. Dark grey carpet is optional.
Fittings	Grill Perforated Steel
Flying	Integral flying system. Intercabinet Angle Adjustments = 17.5° & 30°

SYSTEM SPECIFICATIONS GEO S805 WITH NXAMP/NX242 TDCONTROLLER

Frequency Response [a]	67Hz – 19kHz ± 3dB
Usable Range @-6dB [a]	60Hz – 20kHz
Sensitivity 1W @ 1m [b]	99dB SPL Nominal -97dB SPL Wideband
Peak SPL @ 1m [b]	Configuration dependent [d].
Dispersion [c]	Configuration dependent [d].
Non Coupling Plane	120° (configurable to 80°).
Directivity Index [c]	Not usable as a single cabinet. Configuration dependent [d].
Crossover Frequency	1.6kHz Passive
Nominal Impedance	16Ω
Recommended Amplifiers	1500 to 3000Watts into 4Ω / 4x cabinets per channel. Up to 6x cabinets per channel may be connected to large amplifiers capable of operating into low impedance loads.

SYSTEM OPERATION

Electronic Controller	The NX TDcontroller presets are precisely matched to the GEO S8 Series cabinets and include sophisticated protection systems. Using GEO S8 Series cabinets without a properly-connected NX TDcontroller will result in poor sound quality and can damage components. The GEO S805 & S830 can be used without the optional CD12 Hypercardioid Sub. In this case the NX TDcontroller can be used in stereo. With the CD12 Hypercardiod Sub, each Sub channel requires two NX TDcontroller outputs and the NX TD will operate in mono.
HF Dispersion Configuration	After release of the front grill from its fittings, the HF Waveguide can be configured for 80° or 120° dispersion in the non-coupling plane.
Array Design	S805 and S830 cabinets, having tangent waveguides, can be mixed in the same array. Minimum configuration for Vertical Tangent Arrays is 5x S805 & 1x S830 (4x S805 for paging applications only). CD12s are optional. A a ratio of 1x CD12 per 3x full-range GEO modules is required for proper subbass output.
Speaker Cables	The GEO S805 and S830 are wired 1- & 1+ on both Speakon connectors, 2- & 2+ are not connected.
Rigging System	Please refer to the GEO User Manual before any operation.

SHIPPING & ORDERING

Packaging	S830s are packaged in single units.
Shipping Weight & Volume	2x S830s: 29.2kg (64.2 lbs) 0.135 cu m (4.8 cu ft)

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice. [a] Response Curves and Data: Anechoic Far Field above 300Hz, Half-space below 300Hz. Usable Range Data: Frequency Response Capability with TD crossover slopes removed. [b] Sensitivity & Peak SPL: will depend on spectral distribution. Measured with band limited Pink Noise. Refers to the specified +/- 3dB range. Data are for Speaker + Processor + recommended amplifier combinations. [c] Directivity Curves and Data: 1/3 octave smoothed frequency response, normalized to On-Axis response. Data obtained by computer processing of off-axis response curves. [d] Please refer to the GEO User Manual.

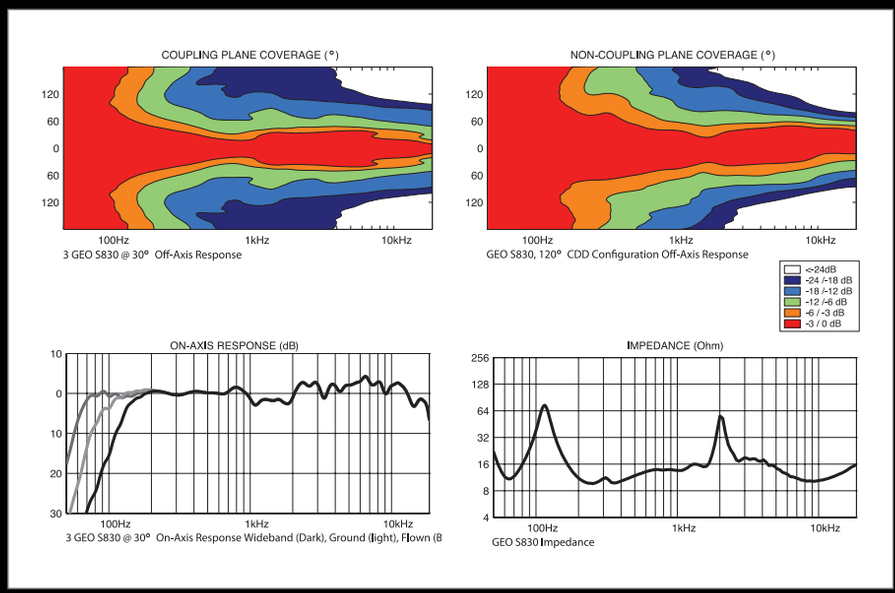
GEO S830

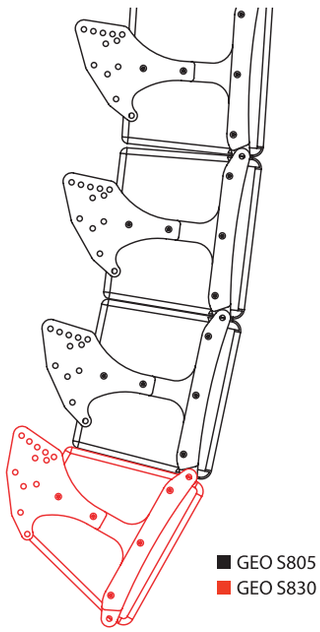
Rear view

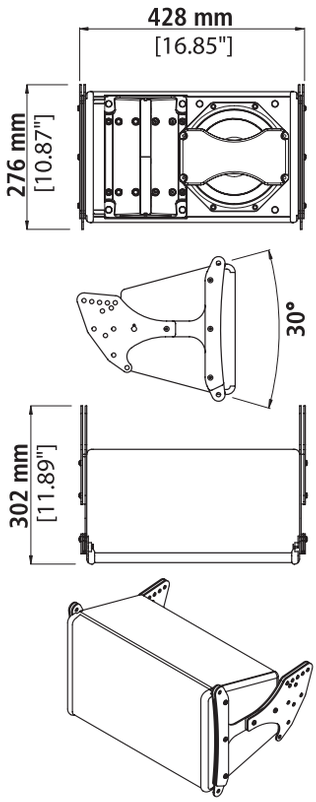
Front/Side view

The compact GEO S830 is a high-output array module intended for horizontal tangent arrays or as a downfill element in curved (tangent) vertical arrays to establish consistent SPL in all coverage areas. The HRW™ allows the 30° S830 and 5° S805 to be coherently arrayed together.

GEO S Series loudspeakers ship with 120° dispersion (in the non-coupling plane) Configurable Directivity Devices (CDD), but are field-changeable to 80° CDDs. To maximize downfill coverage, CDFs are used on GEO S830s for the bottom two rows of curved vertical arrays.







Specifications

GEO S830 PRODUCT FEATURES

Components	LF 1x 8" (20cm) Neodymium Hi-flux 16Ω Driver HF: 1x 1" Throat Neodymium Driver on a Hyperboloid Reflective Wavesource
Height x Width x Depth	428 x 276 x 303mm (16 7/8" x 10 7/8" x 11 7/8")
Shape	30° Trapezoid
Weight	13kg (28.6lbs) net
Connectors	2x NL4MP 4-pole SPEAKON (In & Through)
Construction	Baltic Birch Ply finish with structured black coating. Dark grey carpet is optional.
Fittings	Grill Perforated Steel
Flying	Integral flying system. Intercabinet Angle Adjustments = .31° to 5° (logarithmic steps), 17.5° & 30°.

SYSTEM SPECIFICATIONS GEO S830 WITH NXAMP/NX242 TDCONTROLLER

Frequency Response [a]	67Hz – 19kHz ± 3dB
Usable Range @-6dB [a]	60Hz – 20kHz
Sensitivity 1W @ 1m [b]	99dB SPL Nominal -97dB SPL Wideband
Peak SPL @ 1m [b]	Configuration dependent [d].
Dispersion [c]	Coupling Plane: Not usable as a single cabinet. Configuration dependent [d].
Non-Coupling Plane	120° (configurable to 80°).
Crossover Frequency	1.6kHz Passive
Nominal Impedance	16Ω
Recommended Amplifiers	1500 to 3000Watts into 4Ω / 4x cabinets per channel. Up to 6x cabinets per channel may be connected to large amplifiers capable of operating into low impedance loads.

SYSTEM OPERATION

Electronic Controller	The NX TDcontroller presets are precisely matched to the GEO S8 Series cabinets and include sophisticated protection systems. Using GEO S8 Series cabinets without a properly-connected NX TDcontroller will result in poor sound quality and can damage components. The GEO S805 & S830 can be used without the optional CD12 Hypercardiod Sub. In this case the NX TDcontroller can be used in stereo. With the CD12 Hypercardioid Sub, each Sub channel requires two NX TDcontroller outputs and the NX TD will operate in mono.
HF Dispersion Configuration	After release of the front grill from its fittings, the HF Waveguide can be configured for 80° or 120° dispersion in the non-coupling plane.
Array Design	S805 and S830 cabinets, having tangent waveguides, can be mixed in the same array. Minimum configuration or Vertical Tangent Arrays is 5x S805 & 1x S830 (4x S805 for paging applications only). CD12s are optional. A a ratio of 1x CD12 per 3x full-range GEO modules is required for proper subbass output.
Speaker Cables	The GEO S805 and S830 are wired 1- & 1+ on both Speakon connectors, 2- & 2+ are not connected.
Rigging System	Please refer to the GEO User Manual before any operation.

SHIPPING & ORDERING

Packaging	S805s are packaged in single units.
Shipping Weight & Volume	2x S805s: 29.2kg (64.2 lbs) 0.135 cu m (4.8 cu ft)

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice. [a] Response Curves and Data: Anechoic Far Field above 300Hz, Half-space below 300Hz. Usable Range Data: Frequency Response Capability with TD crossover slopes removed. [b] Sensitivity & Peak SPL: will depend on spectral distribution. Measured with band limited Pink Noise. Refers to the specified +/- 3dB range. Data are for Speaker + Processor + recommended amplifier combinations. [c] Directivity Curves and Data: 1/3 octave smoothed frequency response, normalized to On-Axis response. Data obtained by computer processing of off-axis response curves. [d] Please refer to the GEO User Manual.

GEO S Rigging

GEO S Bumper

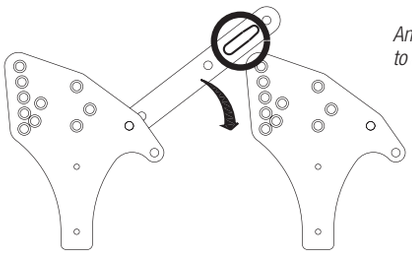
GEO S Sideplates are identical on both S805 and S830 models.

The GEO S Array System is a professional rigging system, and should be handled with extreme care. GEO S850 and S830 loudspeakers are shipped from the factory with identical array assembly hardware. The GEO Array Assembly has three attachment points on each side. The points in the front connect each GEO cabinet to the adjacent enclosures above and below.

The angle between cabinets is set by attaching one end of the angle-setting bar to the proper hole on the angle-setting plate which extends beyond the rear of the cabinet. The GEO S Bumper is symmetrical, enabling you to use GEO loudspeakers in a left/right stereo configuration. The connection between the top GEO S enclosure and the bumper determines the left/right orientation for the entire array.

GEO Array & Deployment Facts

- Horizontal arrays are the best solution for very wide coverage angles, such as stadium bowls, arena “exploded clusters” and multiple balcony, opera-style theatres centre-coverage in L-R-C designs.
- Because the patented GEO HTW employs an hyperboloid acoustic mirror rather than side walls to control dispersion, multiple sources can share a common point of origin.
- Because acoustic centers are in perfect alignment, GEO arrays do not display the interference and lack of coherency that is observed in conventional horn arrays.
- In the non-coupling plane (the vertical or horizontal arrays) GEO wavesources use a diffraction slot. Field-installable flanges can thus widen the vertical dispersion and produce asymmetrical patterns.



Angle-setting bar as used between two GEO S sideplates to adjust tangent array curvature.

GEO S830s with hardware for horizontal rigging.

GEO S Technology in Horizontal Arrays

Do not think of GEO as only a vertical array system. Horizontal arrays of GEO loudspeakers have relatively high power (because of the narrow 30° horizontal array element) and wide front to back coverage of 80° to 120°.

Horizontal arrays deliver equal power to equal angles, with SPL decreasing as you move further back in the audience. Because they are limited to a single row (for a coherent wavefront without interference in the vertical plane), horizontal arrays deliver “equal power to equal angles” and suited for a special set of audience geometries such as stadium bowls, arena “exploded clusters”, opera-style theatres with multiple balcony levels and often as the centre cluster in a L-C-R system.

Horizontal arrays of GEO S830 cabinets provide exceptional control of horizontal coverage and, where the geometry is suitable, either GEO S or GEO T horizontal arrays will deliver a coherent wavefront in the midrange and high frequencies.

GEO S830 allows users to provide 30º increments of horizontal coverage as needed. Where the geometry is suitable, GEO arrays will deliver a coherent wavefront consisting of 30° tangent arcs that is more intelligible and reveals more musical detail than the incoherent sound produced by arrays using multiple conventional horns, which must be separated in space and time.

The GEO S830 is designed to array tangentially with adjacent S830 cabinets to provide a much more coherent wave front from an array of multiple cabinets than conventional arrayable cabinets Where the best fit to the geometry of the listening area is a single row of horizontally-arrayed speakers, GEO technology provides a coherent source of midrange and high frequency energy. This is because GEO wavesources produce a curved wavefront using hyperboloid acoustic mirrors instead of angled sidewalls.

A hyperboloid, a GEO wavesource exhibits dual sources: a real source and a virtual source. The GEO design process puts the virtual source behind the enclosure, and these virtual sources can be perfectly aligned.

CD12 Sub-Bass

Front view

Rear/side view

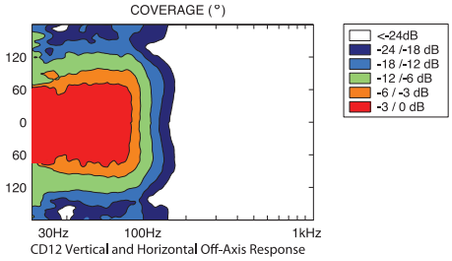
The compact CD12 exhibits innovative control of long wavelength LF energy. The CD12 applies microphone design techniques "in reverse" to produce a hyper-cardioid pattern from twin 12-inch horizontally-opposed woofers.

Sophisticated DSP algorithms, from the NX242 TDcontroller are applied individually to both dual-ported woofers, to produce high-impact forward gain, and +12dB rear attenuation. This means CD12 directs subbass energy towards the audience, and away from open microphones and reverberant surfaces, especially the rear wall.

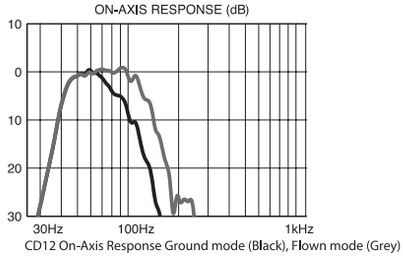
The CD12 is a hypercardioid subwoofer providing directional low-frequency output with dramatic LF reduction behind the cabinet(s). This is achieved by using the interaction of two independently-driven 12-inch drivers, highly specialised ports, and DSP control of the NX242TDcontroller.

To maximize CD12 performance:

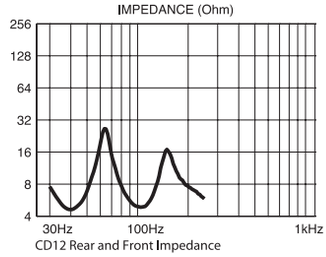
- Maintain at least one meter(3ft+) of free space around ground-stacked CD12(s). Objects or barriers within this space may interfere with controlled wavefront interaction.
- Drive the front and rear drivers with identical amplifier channels set to the same gain. CD12 operation is based on the assumption that front and rear sub-systems are identical in terms of the amplifier's electrical performance.
- When flying the CD12(s), use the linking bar to connect the CD12 bumper to the GEO Bumper and keep at least 50cm(20in) of space between the back of the GEO cabinets and the front of the CD12(s). It provides enough distance so that the GEO cabinets will not interfere with the CD12 wavefronts.
- When hanging or stacking multiple CD12 cabinets, confirm that they are oriented correctly with fronts forward and tops up. Do not hang one CD12 upside down relative to the others.



CD12 Vertical and Horizontal Off-Axis Response

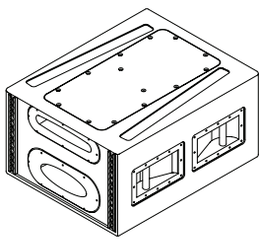


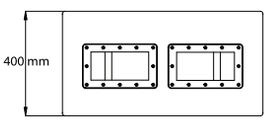
CD12 On-Axis Response Ground mode (Black), Flown mode (Grey)

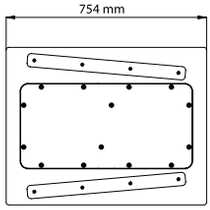


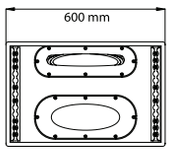
CD12 Rear and Front Impedance

2x CD12s flying with 5x GEO S805s and a GEO S830









Specifications

CD12 PRODUCT FEATURES

Components	2x 12" (30cm) Long-excursion Neodymium 6Ω Driver
Height x Width x Depth	400 x 600 x 754mm (15 3/4" x 23 5/8" x 29 11/16")
Shape	Rectangular
Weight	35kg(78.4lbs) net
Connectors	2x NL4MP 4-pole SPEAKON (In & Through)
Construction	Baltic Birch Ply finish with structured black coating. Dark grey carpet is optional.
Flying points	Integral flying system.

SYSTEM SPECIFICATIONS CD12 WITH NXAMP/NX242 TDCONTROLLER

Frequency Response [a]	42Hz – 130Hz ±3dB
Usable Range @-6dB [a]	39Hz – 150Hz
Sensitivity 1W @ 1m [b]	102dB SPL Nominal
Peak SPL @ 1m [b]	131 to 134dB Peak (500 to 1200W RMS Amp)
Dispersion [c]	Hypercardiod pattern 120° x 120° over the entire usable bandwidth.
Directivity	Control is achieved through DSP algorithms in the NXAMP/NX242 Digital TDcontroller (two channels of the NX TDcontroller are used for the process).
Directivity Index [c]	Q = 3.773DI = 5.7dB over the entire usable bandwidth.
Crossover Frequency	90 or 130Hz Active through NXAMP/NX242 Digital TDcontroller
Nominal Impedance	2x 6Ω
Recommended Amplifiers	2x amplifier channels are required for Hypercardioid operation, each rated at 1500 to 3000Watts into 4Ω per channel. Up to 2x complete CD12s per channel may be connected to a two-channel amplifier.

SYSTEM OPERATION

Electronic Controller	The NX TDcontroller presets are precisely matched to the GEO S8 Series cabinets and include sophisticated protection systems. Using GEO S8 Series cabinets without a properly-connected NX TDcontroller will result in poor sound quality and can damage components.
Subbass	GEO S805 & S830 can be used without the optional CD12 Hypercardioid Sub. In this case the NX TDcontroller an be used in stereo. With the CD12 Hypercardioid Sub, each Sub channel requires two NX TDcontroller outputs, and the NX TD will operate in mono.
Speaker Cables	The front loudspeaker of the CD12 is wired 2+ & 2- while the rear loudspeaker is wired 1- & 1+. The CD12 must use separate cables to the GEO S805/S830.
Rigging System	Please refer to the GEO User Manual before any operation.

SHIPPING & ORDERING

Packaging	CD12s are packaged individually. Minimum configuration for GEO Vertical Tangent Arrays is 5x S805 & 1x S830 (4x S805 for paging applications only). CD12s are optional: but a ratio of 1x CD12 per 3x full-range GEO modules is required for proper subbass output.
Shipping Weight & Volume	1x CD12 = 42.35kg(93.4 lbs), 0.29cu m (10.2cu ft)

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice. [a] Response Curves and Data: Half-space Anechoic below 200Hz. Usable Range Data: Frequency Response Capability with TD crossover slopes removed. [b] Sensitivity & Peak SPL: will depend on spectral distribution. Measured with band limited Pink Noise. Refers to the specified +/- 3dB range. Data are for Speaker + Processor + recommended amplifier combinations. [c] Directivity Curves and Data: 1/3 octave smoothed frequency response, normalized to On-Axis response. Data obtained by computer processing of off-axis response curves. [d] Please refer to the GEO User Manual.

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