

BUTTERFLY HI-PACK

C.D.H. 483

TECHNICAL SPECIFICATIONS

FREQUENCY RESPONSE

Single element +/- 3dB	110Hz ÷ 18kHz
Coupled array four units +/- 3dB	80Hz ÷ 18kHz

NOMINAL COVERAGE ANGLE -6dB

Horizontal	90°
Vertical	Depending on array height and curvature

BANDPASS NOMINAL IMPEDANCE

Low/mid	4 Ohms (min. 3.5)
High	8 Ohms (min. 8.3)

INPUT POWER RATING (AES-Standard)

Continuous WRMS	800	High-pass filtered low/mid
	120	High
Calculated W peak + 6dB	3.200	High-pass filtered low/mid
	480	High
Continuous VRMS	56.57	High-pass filtered low/mid
	30.98	High

CALC. MAX SPL - 1m (Single Unit - full space)

Continuous	128.5	Low/mid
	131	High (8 kHz)
Calculated +6dB Peak	134.5	Low/mid
	137	High (8 kHz)
Calculated +10dB Peak	138.5	Low/mid
	141	High (8 kHz)

Min. box array MAX SPL - 1m

Continuous	140.6	4-box flat array low/mid
	143	4-box flat array high (8 kHz)
Calculated +6dB Peak	146.9	4-box flat array low/mid
	149	4-box flat array high (8 kHz)
Calculated +10dB Peak	150.6	4-box flat array low/mid
	153	4-box flat array high (8 kHz)

8-box array - MAX SPL - 1m

Continuous	146	8-box flat array low/mid
	146	8-box flat array high (8 kHz)
Calculated +6dB Peak	152	8-box flat array low/mid
	152	8-box flat array high (8 kHz)
Calculated +10dB Peak	156	8-box flat array low/mid
	156	8-box flat array high (8 kHz)

Single Unit Weight (kg)

Net	35 (Including flying hardware)
-----	--------------------------------

Single Unit Dimensions (mm)

Front Height	240
Rear Height	194
Width	700
Depth	600

Number of Speakers

5	
Low/mid	2x 8" NdFeB bandpass loaded woofers
Mid	2x 8" NdFeB partially horn-loaded mid woofers (High heat dissipation ferrite magnets)
High	1x 3" Diaphragm NdFeB, D.P.R.W.G. (Double Parabolic Reflective Wave Guide) loaded compression driver

Operating configuration

Biamped, 3 sections (mid-bass section mechanically filtered)

Enclosure

High impact exterior grade shaped composite plywood

Finish

Textured scratchproof fire-retardant black paint

Connectors

2x Neutrik NL4

Rigging hardware

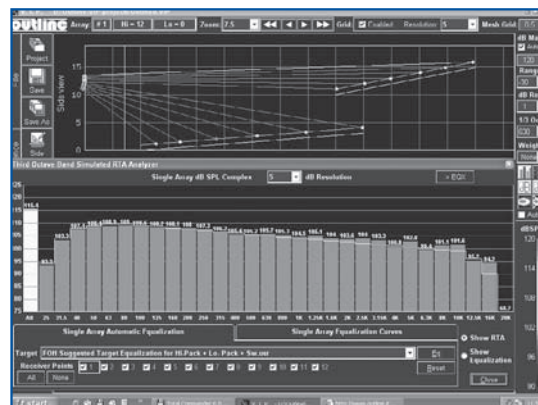
Integrated high-load flying hardware and handles

Maximum Degree Cabinet Coupling

7.5° with 0.125° minimum increments

Maximum Flyable Elements

32 Height 7.68 m (25.20 ft)
Weight 1120 kg. (2464 lb)

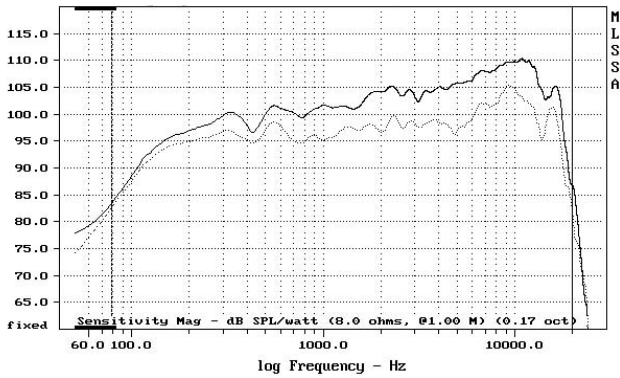


The countless acoustic parameters shown in the various types reports include the interesting exclusive display (in every position) of the planes crossed by array elements' aiming axes and sound pressure level with 1/3 octave bargraphs (in short, the spl status shown in 1/3 octave bands) which takes into consideration the effect of all the elements of the array in that point.

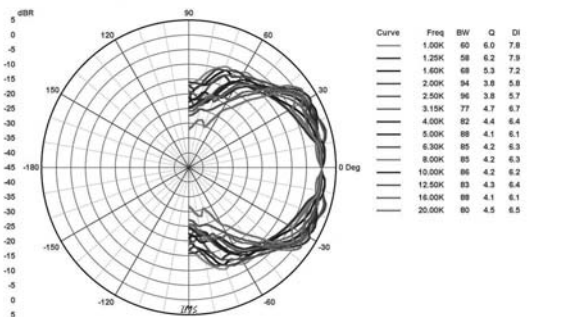


Close-up of the graduated load-bearing bar: it's designed to enable a setting increment of 0.25 degrees in the angle between array elements (a version with 0.125 degrees increments is available on request).

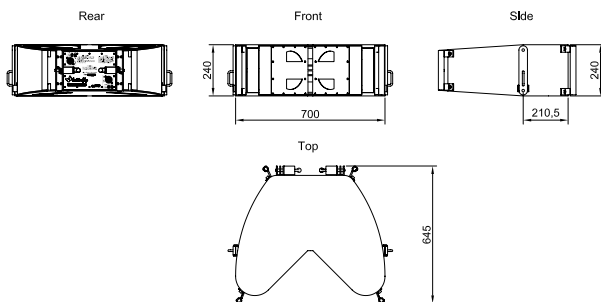
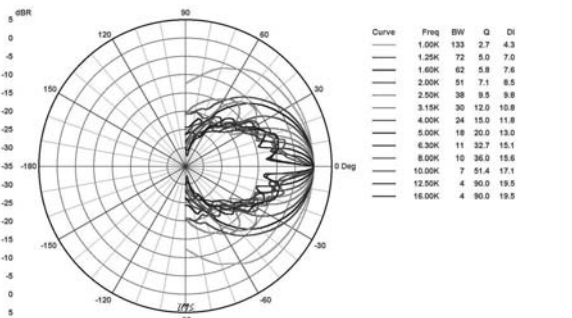
frequency response



horizontal polars



vertical polars



DESCRIPTION

The C.D.H. 483 Hi-Pack is the Butterfly system's element for mid-low, mid and high frequency reproduction. The cabinet has an unmistakable shape covered by an international patent which brings to mind the butterfly from which it takes its name, thanks to the triangular opening in the upper and lower "sides". This original design solution favours the optimum coupling of array elements up to the highest frequencies, keeping the distance between the sources as short as possible and at the same time providing them with a continuous loading 'baffle' which shape doesn't accentuate any diffraction or alteration of mid/high response.

HF SECTION and D.P.R.W.G. DEVICE

The high frequency section of the Butterfly system is equipped with a 3" (1.41" throat) compression driver coupled with a D.P.R.W.G. (Double Parabolic Reflective Wave Guide) device geometrically based entirely on precise mathematic calculations that took three years of research and tests, another Outline invention for which an international patent has been applied for. It has the job of taking a circular planar (flat) wavefront emitted by the source at its input (e.g. that of a compression driver) and transforming it into a rectangular planar wavefront at its output, keeping signal paths identical from every emission point of the source. The rectangular planar wavefront thus obtained can be loaded by an appropriate horn or waveguide to ensure the necessary coverage.

MID-BASS AND MID SECTION

The C.D.H. 483 is a three-section element/enclosure designed for biamping. As well as a 3" compression driver, it's equipped with four high-efficiency 8" mid woofers: two band-pass loaded (110 ÷ 400Hz) and two reflex high-pass (110 ÷ 1250Hz) loaded by the sides of a waveguide with a 90° dispersion angle. These two sections are connected in parallel without any type of passive crossover, so can both be powered using one amplifier. By means of the appropriate upper mechanical filter of the first band-pass section, obtained with the precise restricting design of the resonance chambers and the respective tuning, emission phase has been shifted, enabling the energy in the portion of band reproduced by both sections together to be doubled. This peculiarity, at present an exclusive feature, enables to make up for the lack of power in the mid/low frequencies typical of other line array elements whose compact dimensions are comparable to those of Butterfly C.D.H. 483 High-Packs.

BUILT-IN HARDWARE

Butterfly Hi-Pack and Low-Pack elements are both equipped with built-in flying hardware enabling the angle between the elements to be adjusted with minimum increments of as little as 0.125 degrees. The dimensions and material used have enabled this hardware (patent pending) to be certified according to the strictest international norms, for flying an array of up to 32 C.D.H. 483 Hi-Packs and up to 24 C.D.L. 1815 Low-Packs in another array.

FLIGHT-CASES FOR TRANSPORTING THE ELEMENTS

Dedicated cases fitted with sturdy smooth-running wheels have been designed and built to transport and protect the elements. A 2 or 3-unit case protects Hi-Packs (2-unit case for Low-Pack) and becomes a handy trolley, designed to facilitate fast hassle-free lifting of each element.

V.I.P. 2 - SOFTWARE

The Butterfly project includes the design of sophisticated acoustical and mechanical simulation software, which greatly facilitates installation, setting and aiming both flown and stacked systems of Line Array elements. V.I.P. 2 (the abbreviation of Vector Implementation Protocol) software was completely developed with a high-level programming language using powerful 'Open GL' graphic libraries. The result is a 'tool' able to guide PA system engineers through correct set-up procedure from an acoustic and mechanical point of view allowing to achieve almost absolute precision between prediction and reality through a single screen showing absolutely all the mechanical and acoustic information necessary for riggers and system engineers to proceed with the installation of each single array.

Much more than a mere Vertical Line Array "aimer", V.I.P. 2 offers simulations of not only the SPL for each point in the area in question, but also frequency simulations in 1/3 octave. As a natural complement to the virtual RTA spectrum analyzer, a virtual automatic 1/3 octave equalizer is available enabling users to predict even the equalization to be used on systems to obtain the required frequency responses in the required listening area.

The program can simulate in a really short time up to sixteen different sound systems simultaneously, made up of Hi-Packs, Lo-Packs and Subtech 218 subwoofers, positioned to cover up to eight different listening areas simultaneously, by making V.I.P. 2 an even more exclusive product on the international scenario.

loudspeakers

BUTTERFLY HI-PACK C.D.H. 483

outline

Via L. da Vinci, 56 - 25020 Flero (Brescia) Italy
tel. +39 030 3581351 - fax +39 030 3580431
www.outline.it - e-mail: info@outline.it