



4000 HI | 4000 LO

Presentation

The APG 4000 System is the multi purpose system in the Matrix Array Series. It was designed to fulfil high power medium-range applications. (5 to 40 m either indoor or outdoor)

A APG 4000 system is made up of two speakers visually identical, that integrate 4 organised acoustic ways following the principle of collinearity.

Acoustic performance and system ergonomics give it versatility allowing single use as well as complex matrix couplings.

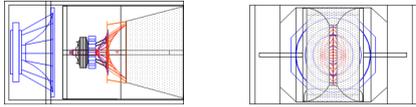
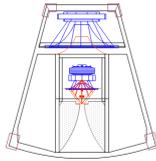
The Matrix Array systems use ISOTOP™ technology allowing us to reach efficiency levels comparable to those obtained with conventional compression drivers while sensitively reducing distortion ratios and increasing the bandwidth and power performance.

The combined ergonomics characteristics and acoustic dispersions (60° H x 15° V) give the APG 4000 a real flexibility between the two applications modes : flown or stacked.

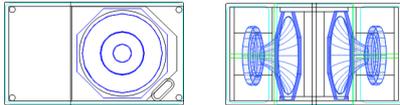
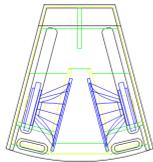
Benefits of APG4000 systems

- Carry out coherent source assemblies in the horizontal plane so that the **horizontal** acoustic dispersion can be adjusted with respect to the width of the listening area.
- Carry out coherent source assemblies in the vertical plane so that the **vertical** acoustic gap and the **potential range** of the system can be adjusted.
- Adapt the allocation of spectral energy to the nature of the sound message to be reproduced (music, playback, speech) thanks to the separation of HI and LO speakers.
- Captive rigging systems for a substantial reduction in on-site installation time.
- The possibility to combine with APG6000, which offers optimal adaptability to the Matrix Array system in sites to apply the sound to.

1. The APG 4000 system



4000 HI top side and front view



4000 LO top side and front view

An APG4000 system is made up of two identical outer speakers: 4000HI and 4000LO. These two speakers reproduce the 800-19 kHz and 160–800 Hz bandwidths respectively.

The **4000 HI** speaker is made up of a **Lo/Mid (160-800 Hz)** section and of a **Mid/Hi (800-14 kHz)**. The Lo/Mid section comprises a 15" loudspeaker set at the back of the cabinet and mounted in compression + horn. The Mid/Hi section is made of a 6,5 + 1HF driver made in compression by the exclusive APG ISOTOP™ wave guide able to reproduce an Isophase front wave. This motor allows us to reach efficiency above 104 dB in the 500 Hz -19 kHz bandwidth. The 60° horizontal dispersion is controlled from 500Hz thanks to the combination of the horn technologies from the Lo/Mid and Mid/High sections.

The **4000 LO** speaker is equipped with two 15" loudspeakers, set up in double interactive chambers. These loudspeakers are identical to those used in the MID section in order to respect the same harmonic tone reproduction. The frequency range reproduced is **45 -160 Hz**.

2. Additional systems



APG6000



TB218S

TB215S

TB118S



BM300C



SC20



DS15

APG6000

The long-range APG6000 system was designed to be acoustically and ergonomically compatible with the APG4000 system when medium-range coverage is established (**beyond 40 m**). The complete configuration then allows us to have optimal site and application adaptability: horizontal dispersion, range, dynamic capacity, balance between low and Mid/Hi..

SUBWOOFER

Certain uses need a response extension in sub-bass as well as a heightened dynamic reserve. For this, several subwoofer types are compatible: TB118S, TB215S, TB218S.

- ✘ Bandwidth of a APG4000 only kit: **50-19 kHz**
- ✘ Bandwidth of a APG4000 + TB215S kit: **40-19 kHz**
- ✘ Bandwidth of a APG4000 + TB118S kit: **30-19 kHz**
- ✘ Bandwidth of a APG4000 + TB218S kit: **30-19 kHz**

Presets and “cardioids” configurations for TB series subwoofers are provided on request

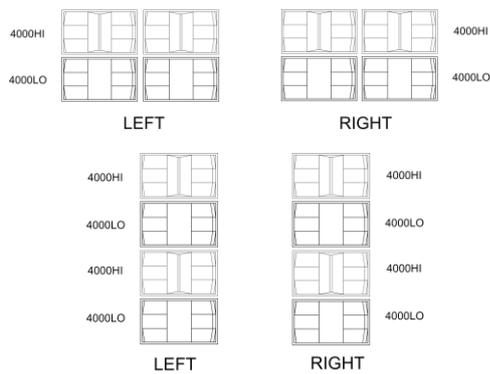
Front fill / Down fill / Back fill / Side fill

Coverage complement systems can also be required to cover the following areas: front of the stage, sidefills.

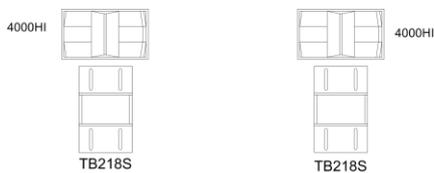
Sidefills and **backfills** are the areas close to the stage and on-stage and need speakers with directivity and range capacity that are adapted to areas to be used: **APG Dispersion series, Beam series**.

Depending on set-up constraints, it is possible to resort to the **SC20** long-range additional system or sidefill system of Matrix Array configurations.

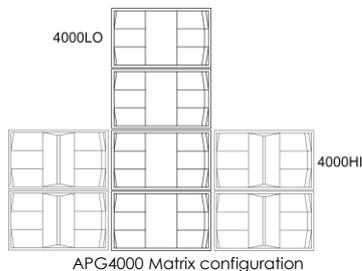
3. Configuration types



The two possible configurations with a standard Matrix Array kit.



Simple configuration with subwoofers



APG4000 Matrix configuration



Mixed configuration 4000/6000

1. Mixed configurations

The two possible configuration set up with a standard Matrix Array kit are :

- ✗ “horizontal coupling” configuration
- ✗ “vertical coupling” configuration

The ergonomics of the speakers with the specific design of the rigging and flying systems allow either a vertical coupling or an horizontal coupling.

With the Matrix concept, the APG4000 allows direct speaker coupling or “Complex Matrix” configurations.

2. Simple configurations and additional system

Single speaker

One 4000HI speaker is the smallest possible configuration in wideband mode:

Other possible applications are :

- ✗ Additional speaker : central cluster, delay, etc.
- ✗ Medium range music applications.
- ✗ Vocal applications: (ex : conference) in that special case low frequency speakers (LO) are optional.

Combined with subwoofers

4000HI speaker in the wideband can directly be combined with subwoofers without 4000LO speakers when the need for high power in limited bandwidth is required [50-80Hz]

3. Matrix configurations

The APG4000 system allows us to set up many columns matrix configurations and thus:

- ✗ **increase the horizontal dispersion angle** based on the column number : **1 column/60°**, **12 columns/360°**
- ✗ **separately configure the LOs and HIs** based on required performances for each of the sections
- ✗ **adapt** the power in the base and the geometry in the acoustic source.

The configuration to the left offers a large horizontal dispersion and a long range capacity in the low frequencies at the same time.

4. Mixed configurations

APG4000 system is fully compatible and complementary with other line source systems such as APG6000 series. **APG6000** system can thus be implemented as a **long throw additional system** (beyond 30-40 m) to an APG4000 configuration of medium range application (until 30-40 m).

A mixed configuration makes it possible to :

- ✗ Diversify the number and the nature of the speakers **vertically** to adapt **power capacity and range** from the resulting sources.
- ✗ Diversify the number of columns of cluster to adapt **the horizontal coverage** from resulting sources.
- ✗

The APG4000 and APG6000 Matrix Array systems are compatible on the acoustic and mechanical plane, i.e.: same components and internal technology, same type of ergonomics, same horizontal acoustic dispersion characteristics, cabling systems and compatible rigging and flying system. This allows for a multitude of capable configurations to respond to all outdoor sound events.

4. Electronics and wiring

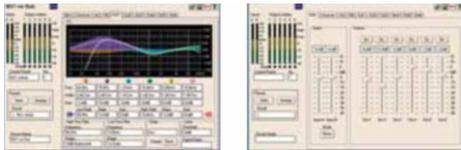
Processing/Amplification

A 4000 system's connection order is:

1. DMS26 configuration digital processor(s),
2. 4000 SP analogue loud-speaker's processor(s),
3. Power amplifier(s).
4. Speakers



DMS26 configuration processor



PWAPG Interface



4000SP HP processor

1. DMS26 configuration processor

The APG DMS26 processor has 2 inputs, 6 analogue outputs, and 96 kHz /24 bit accuracy. It is possible to network several of them for large-scale configurations and to remotely control it from the **PWAPG** computer interface.

Constructor presets for different speakers and configurations are supplied with the DMS26. The user can also create their own presets and stock them thanks to PWAPG.

2. 4000SP loudspeaker processor

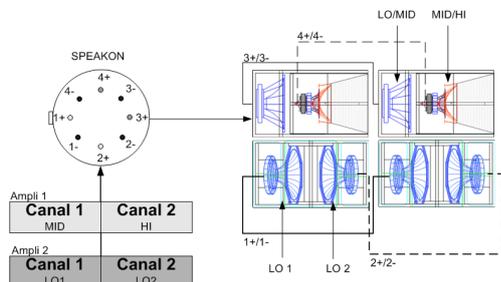
The 4000SP processor is intended to be used for the following functions in a sound system consisting of 4000HI and/or 4000LO speakers as well as subwoofers:

- ✗ Active filtering on 2x3 lines + sub,
- ✗ Control of operational modes
- ✗ Frequency and phase response optimisation (levelling, temporal alignment, etc ...),
- ✗ Dynamic protection of the components by destructive parameter simulation
- ✗ Signal distribution.

3. Power amplifiers

APG recommends using professional-level amplifiers with the following powers (equal or higher):

- ✗ **4000 LO** : 2 x 2000 W/4 Ohms
- ✗ **4000 HI** : *Lo/Mid section*: 2000 W/4 Ohms
Mid/Hi section: 800 W/8 Ohms



"Loudspeaker" internal wiring

The connection between the amps and the speakers needs an 8 point Speakon™ connection linked to 8 2.5mm² section conductor cables:

- ✗ 1+/1- LO1 channel (channel 1)
- ✗ 2+/2- LO2 channel (channel 2)
- ✗ 3+/3- LO MID channel (channel 3)
- ✗ 4+/4- HI channel (channel 4)

Wiring of Matrix Array systems are standard: 8 points conductor cables, 8 points Speakon allowing automatic feed of the speaker sections.

For an APG4000 base kit (2x4000LO and 2x4000HI per side), there are 4 sections of 4 ohms :

- ✗ LO1 and LO2 for 4000LO,
- ✗ MID and HI for 4000HI.

5. Synoptic

The APG4000 system can be used with anything from a unit speaker up to a large scale matrix configurations. A base kit offers dispersion and configuration versatility (60°x15°, 60°x30°, 100°x15°, 120°x15°) and has an optimized amplification Rack

A base kit

Composition:

4x4000HI
 4x4000LO
 1 4000SP processor
 1 DMS26 processor

Two "mono" amplification racks:

1 amp 2 channels for 4000LO (2 sections : LO1 and LO2)
 1 amp 2 channels for 4000HI (1 section MID, 1 section HI)

Wiring kit :

2x8 points conductors cables (2,5 mm²) → 20 m MAX
 6x8 points conductors cables (2,5 mm²) → 1,5 m

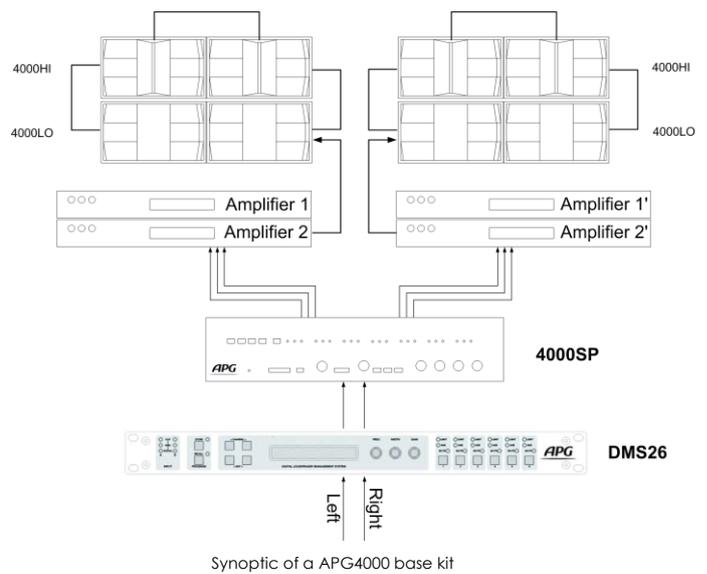
Example of kit with subwoofer and frontfill

Composition

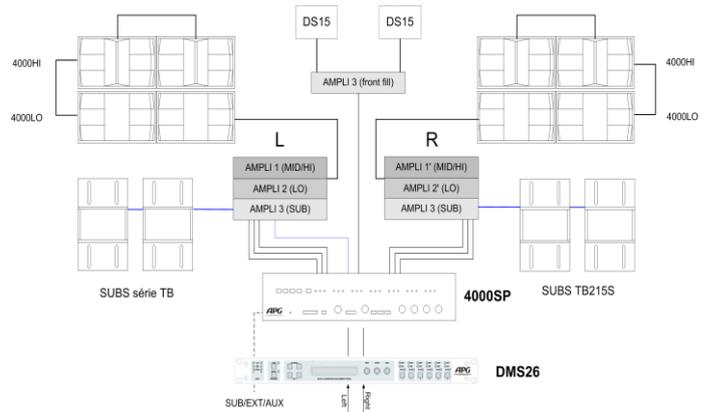
4x4000HI
 4x4000LO
 4xS TB Subs
 2xDS15
 1 processor 4000SP
 2 processors DMS26

Two "mono" amplification racks:

1 amp 2 channels for 4000LO (2 sections : LO1 and LO2)
 1 amp 2 channels for 4000HI (1 section MID, 1 section HI)
 1 amp 2 channels for Subwoofers (2 SUBs per channel)

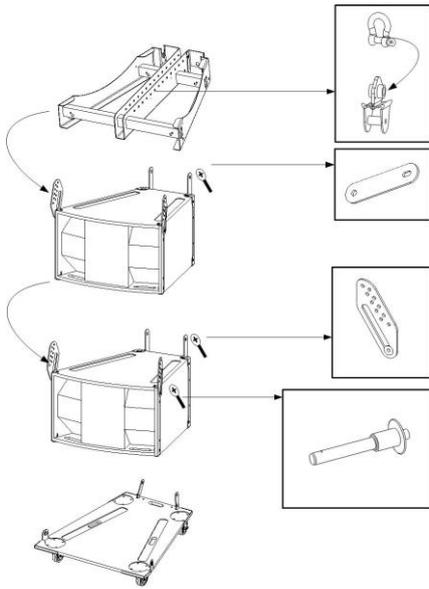


Synoptic of a APG4000 base kit



Synoptic of a kit with subwoofers and frontfill

6. Rigging and Transport



Preparation and implementation

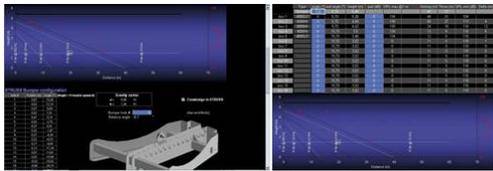
In the workshop

- Preliminary examination of mechanical and acoustic adjustments thanks to the **Matrix Aiming Tool**.
- Cluster construction in column segments (2, 3 or 4 stacked speakers) directly assembled on 6000PR (height less than 1.60m). The bumpers are pre-assembled on the first column segments
- Angle pre-configuration thanks to a sliding guide while keeping stocking and transport position at 0°. The angles between the boxes are created during system lifting.

In the field

The transport and fastening systems were thought to **accelerate the on-site installation time and to limit potential mistakes in the field** thanks to preparation at the workshop.

- Transport of the clusters thanks to the wheeled 6000PR tray.
- Velleda labels at the back of the speakers allow us to indicate the destination and assembly order of the segments in the cluster to the technicians.
- Cluster setting up and/or flying.



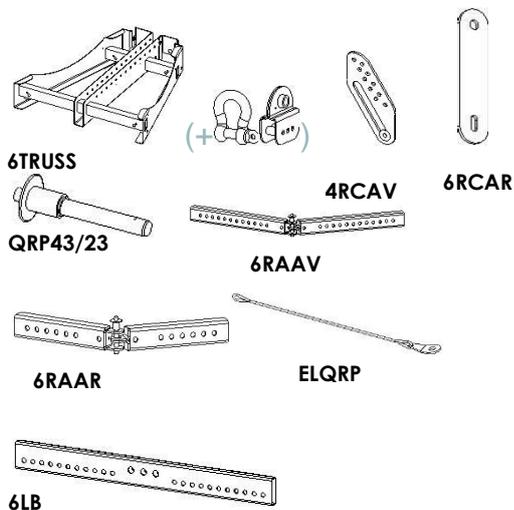
Interface of the Matrix Aiming Tool

Matrix Aiming Tool

The '**Matrix Aiming Tool**' developed by APG allows us to precisely calculate and determine all mechanical adjustments of the Matrix Array speaker clusters.

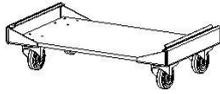
The Matrix Aiming Tool spreadsheet allows us to link acoustics and system geometry, and thus preview angulations and mechanical variables in the workshop (rider position on the bumper, horizontal connections etc.).

This characteristic specific to the APG fastening system is going to allow us to **save precious time in the field, which benefits electro-acoustic and artistic adjustments**.



Rigging and flying system

REF.	Designation	Qty.1	Qty. 2
6TRUSS	Lifting Truss (bumper) supplied with shackle and angulation adjustment piece	2	4
6CAV	Front vertical lifting connection	16	16
6RCAR	Back vertical lifting connection	16	16
6RAAV	Front horizontal coupling connection	0	4
6RAAR	Back horizontal coupling connection	0	2
QRP23EL	Ball-pin L=23mm with ELQRP sling	16	16
QRP43EL	Ball-pin L=43mm with ELQRP sling	16	16
QRP43	Ball-pin L=43 mm	32	32
6LB	Lift Bar	0	2



4000PR



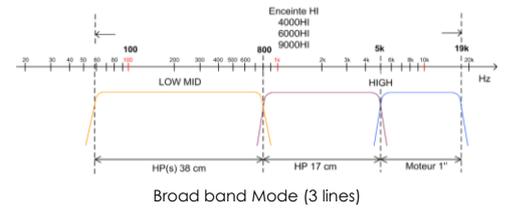
6000PR

Transport

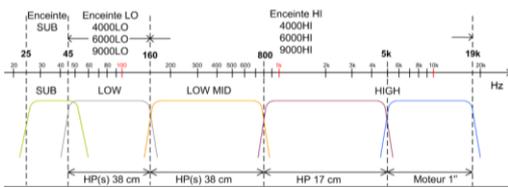
Solution 1: 6000PR, castor plate for multiple cabinet. 4 boxes of 4000s with complete rigging (truss) is the **maximum load**. (1,60 m high).

Solution 2 : 4000PR, individual castor plate.
4 revolving wheels with brakes, 125mm diameter. It's an individual castor plate, protecting the front side of the speaker.

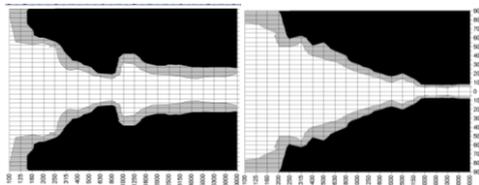
7. Specifications



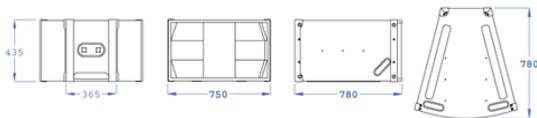
Broad band Mode (3 lines)



Complet base kit mode (4 lines)



Horizontal dispersion Vertical dispersion



Sides



Grips

Technical Specifications

4000 LO 4000 HI

Speakers

	Section		
	Mid	Hi	Hi
4 way response (± 3 dB)	45 – 160 Hz	160 - 800 Hz	0,8 - 19 kHz
3 way response (± 3 dB)	-	65-800 Hz	0,8 - 19 kHz
Efficiency @1W 1m	104 dB SPL	104 dB SPL	108 dB SPL
Maximum level at 1m	136 dB SPL	134 dB SPL	139 dB SPL
Crest level at 1m	139 dB SPL	139 dB SPL	139 dB SPL
Nominal impedance	2 x 8 Ohms	8 Ohms	8 Ohms
Horizontal gap angle	-	60°	
Vertical gap	-	15°	

Components

Transducer	2 x 15"	1 x 15"	1 x 6,5" & 1" HF coaxial
Coil diameters.....	100 mm	100 mm	50 mm & 45 mm
AES Power.....	2 x 1000 W	1000 W	300 W

Dimensions and ergonomics

Dimensions (mm).....	440 x 750 x 780	
Net unit	40 kg	52 kg
mass.....		

Manufacture

Cabinet making is in covered birch with a black high resistance aquarethane coating. The front protection grating is made of high transparency perforated steel + acoustic foam.

Seven integrated grips allow for maintenance.

APG4000 conformity declaration

APG France Ltd states that the equipment described in this document conforms with the following European directives:

Electromagnetic compatibility:

89 / 336 / EEC

93 / 68 / EEC

Directives regarding base voltages:

73 / 23 / EEC

This declaration certifies the accordance of products submitted to the following norms:

EN 55013: 1995 Emissions

EN 50082-1: 92 Immunity

EN 60065: 1994 Safety norms

PRODUCT: The products mentioned in the present document are entirely manufactured and assembled in France according to enforced European laws.

8. MISCELLANEOUS

Training

APG organises training days aimed at different sound engineering specialisations. Two training levels are given:

Technician level
Engineer level.

Technical support

APG support engineers constantly ensure advanced technical support in association with operator's practical experiences in order to achieve a technical solution that is adapted to the most reasonable of the supply project's group of technical and economic criteria.

Also, as well as acoustic studies carried out from classic simulators, APG has elaborated two "project validation" tools allowing us to validate a sound project from any site by the design office: the APG project form and APG project guide software.

General information

APG France refuses all responsibility involving any possible mistakes of APG product use that the user is responsible for and strongly advises you to become familiar with the safety recommendations described in the product application review before use.

APG leads a research and development policy with the goal of improving its products. For this reason, new materials, fabrication methods and rule changes can be introduced without any warning. Because of this, certain aspects of an APG product can differ from their publicised description. However, unless otherwise indicated, its properties will be better than or the same as those published. These technical specifications, dimensions, weight and properties do not represent quality guarantees.

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