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# 1. GENERAL INFORMATION

#### WELCOME!

Thank you for purchasing a product designed and developed in Italy by dBTechnologies! This 3-way active line-array module is the result of years of experience and innovation on speakers, with the use of cutting-edge solutions in the field of acoustics, electronics and research on materials.

#### PRELIMINARY OVERVIEW

The DVA K5 active line-array module is a 3-way speaker designed by building upon the innovation and professional quality of the DVA series. The 2 1" compression drivers (voice coil: 1.4"), 1 6.5" mid-range (voice coil: 2"), 1 8" woofer (voice coil: 2.5") are housed in a polypropylene cabinet, reinforced by a metal frame optimising its sound performance. The DSP, controlling the next-generation amplifier DIGIPRO G3, allows to easily and accurately configure the line-array sound behaviour according to: number of modules, angles of installation between the K5 modules, distance between line-array and audience. When coupled with the new DVA KS series subwoofers, finally, the module can meet all professional needs, in any context and installation. The main features of K5 are:

- powerful and noiseless amplification section, thanks to the new DIGIPRO G3 D-class amplifier,
   requiring no active ventilation
- SPL (peak) of 129 dB
- high-quality transducers, sound design optimised for line-array use, full-range frequency response for professional use
- equipped as standard with pins and built-in brackets, pre-drilled and graduated, for easy, accurate and ready assembly/disassembly in a line-array configuration
- quick and accurate DSP configuration through 2 rotary encoders, optimising coupling and high frequency compensation
- Easy to handle and transport
- Lightweight, thanks to the polypropylene box and to the use of neodymium magnet components.

#### **USER REFERENCES**

To get the most from your DVA K5 we recommend that you:

- thoroughly read the quick start user manual you will find in the package and this manual, and keep it throughout the product life.
- register the product on the site http://www.dbtechnologies.com, in the "SUPPORT" section
- keep the proof of purchase and the WARRANTY (User manual "section 2").

## MECHANICAL AND ACOUSTIC CHARACTERISTICS

#### **DIMENSIONS**

DVA K5 only weighs 14.7 kg (32,41 lbs), and thanks to its small dimensions -  $580 \times 240 \times 327 \text{ mm}$  - it can be handled and transported easily.

The reinforced polypropylene cabinet has a metal inner frame, preventing unwanted resonances and vibrations. The built-in brackets and the standard pins are ready to use and allow to quickly install, in the proper arrangement, a line-array having the desired characteristics.

#### ACOUSTIC COVERAGE

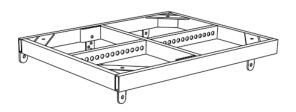
The acoustic coverage, for reference purposes, of a single module, as shown in the figure, is of 100 x 15°. The actual coverage depends on the use of multiple modules in a linearray arrangement. We recommend that you design it with the help of the free software dBTechnologies Composer.

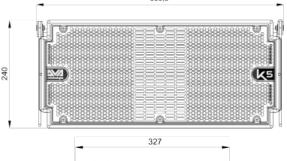
#### **ACCESSORIES**

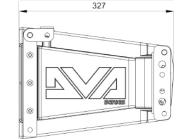
The following items are available as optional, for system installation, transport and protection:

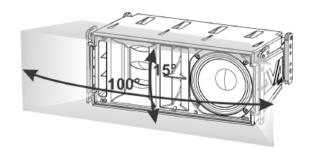
- DRK-10 and DRK-20 fly-bars
- DRK-HK hook, to be used in conjunction with DRK-20
- DRK-20M motor-driven fly-bar
- SRK-10 installation kit (for installation with DVA KS10 subwoofer only)
- Bracket DWB-3 for wall installation and DSA-4 for floor or pedestal support installation.
- Trolley allowing to transport 1 to 6 DT-6 modules
- Flight case containing 1 to 4 DF-4 modules
- Built-in flight case with trolley, housing and allowing to transport up to 4 DTF-4 modules
- Lifting equipment for hanging speakers DRL-45
- Extension cables DCK-15, DPC-15, DAC 15, DPC-1000M, cable kit DCK-15, DCK-45 and DCK-45 TypeB

The figure below shows a sample DRK-10 fly-bar and the fly-bar in question installed on a DT-6 trolley, for transport purposes only.











For any further information, please refer to the site <u>www.dbtechnologies.com</u> and to the relevant manuals of each individual accessory.

# CHARACTERISTICS OF THE AMPLIFICATION AND CONTROL SECTION

The D-class next generation amplifier DIGIPRO G3 features a power supply section with a particularly efficient auto-range function. The system is noiseless, as it doesn't require a ventilation system.

The system is controlled by a powerful DSP allowing to readily and quickly configure the line-array in any usage context

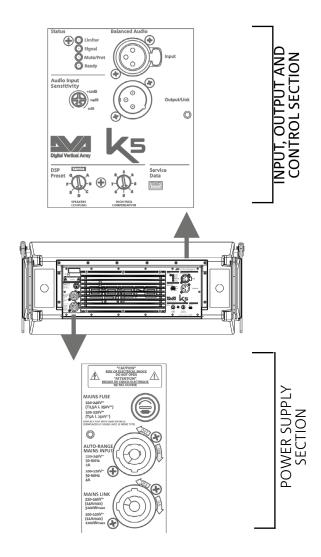
The DIGIPRO G3 panel consists of:

- Input Output and Control section
- Power supply section



#### ATTENTION!

- Protect the module from humidity.
- Never try to open the amplifier.
- In case of malfunction, immediately cut off the power supply, by disconnecting the module from the mains, then contact an authorised repairman.



#### INPUT OUTPUT AND CONTROL SECTION

#### 1. BALANCED AUDIO INPUT Audio input for a cable equipped with a balanced XLR connector.

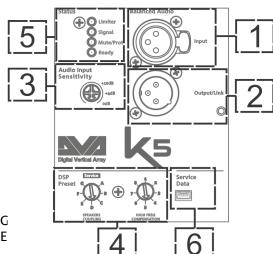
#### 2. LINK AUDIO OUTPUT

Balanced XLR output, allowing to send the input audio signal to another amplified speaker.

#### 3. AUDIO INPUT SENSITIVITY

It allows to vary the input sensitivity. Before turning on the unit, make sure that the Audio Input Sensitivity is turned to 0 dB.

4. DSP CONTROL ROTARY ENCODERS FOR IN LINE-ARRAY SETTING The "SPEAKER COUPLING" rotary encoder and the "HIGH FREQUE COMPENSATION" rotary encoder allow to optimise the sound behaviour of the K5 modules configured in a line-array. Also refer to paragraph "IN LINE-ARRAY CONFIGURATION AND OPTIMISATION".



#### 5. LEDs (Limiter, Signal, Mute/Prot, Ready)

During normal speaker operation with audio input signal, the Ready LED is steadily on, the Signal LED blinks indicating the signal presence.

#### 6. "SERVICE DATA" USB PORT

The type B mini-USB B port allows to update the product firmware. For further information, please refer to the Web site (see DOWNLOADS section and )

LED TYPE	SPEAKER SWITCH-ON	NORMAL OPERATION	GENERIC WARNING	STOP DUE TO SPEAKER MALFUNCTION
LIMITER	OFF	OFF, IT STARTS BLINKING ONLY IN DISTORSION CASE	TEMPORARY BLINKING	ONGOING CYCLIC BLINKING
SIGNAL	OFF	BLINKING WITH SIGNAL	NORMAL INPUT AUDIO INDICA- TION	OFF
MUTE/ PROT	ON FOR A FEW SECONDS	OFF	TEMPORARY BLINKING	STEADILY ON
READY	OFF	STEADILY ON	STEADILY ON	OFF

LEDs table

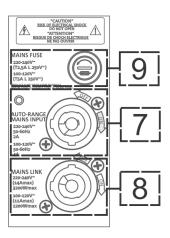
# **POWER SUPPLY SECTION**

- 7. "AUTO-RANGE MAINS INPUT" POWER SUPPLY INPUT Power supply input for cable equipped with NEUTRIK® powerCON® connector.
- 8. "MAINS LINK" POWER SUPPLY LINKING OUTPUT
  Output allowing to extend the power supply to a second module through a cable equipped with a NEUTRIK® powerCON connector.
- 9. "MAINS FUSE" PROTECTION FUSE Mains fuse



#### ATTENTION!

- The speaker is supplied with a pre-installed fuse designed to operate within the 220-240 V range.
   Should it need to operate within the 100-120 V
- Disconnect all connections, including the power supply one.
- 2. Wait for 5 minutes.
- 3. Replace the fuse with the one included in the package for the
- Only use cables equipped with high-quality genuine Neutrik® connectors.
- Never use the speaker for a prolonged time while the limiter LED is on or blinking, indicating the equipment is running under excessive stress conditions



# 2. FIRST SWITCH-ON

# **PACKAGE CONTENTS**

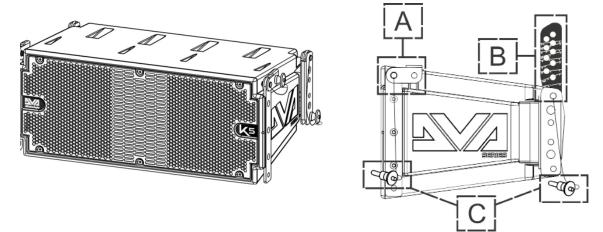
The DVA K5 package includes:

- 1. DVA K5
- 2. Quick start and warranty/safety-related documents
- 3. Fuse to be installed if the system is to operate within the 100-120V range

# PRELIMINARY OPERATIONS

The DVA K5 built-in mechanical components installed on each speaker side are:

- A FRONT BRACKET
- **B-PRE-DRILLED AND GRADUATED REAR BRACKET**
- C QUICK COUPLING/RELEASE PIN



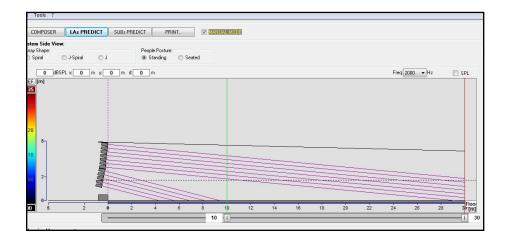
Before installing the equipment, when opening the package remember to:

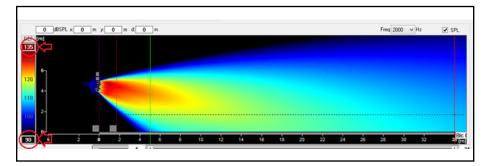
- Remove the plastic protections from the side pins
- Remove the bag containing the fuse

## USING DBTECHNOLOGIES COMPOSER

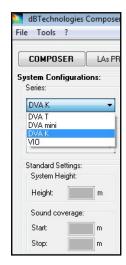
The software dBTechnologies Composer, which can be downloaded for free from www.dbtechnologies.com, is a tool allowing users to properly design their audio system, recommended for all the equipment belonging to the DVA K series.

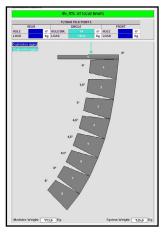
It proposes the optimum solution for the selected areas, specifying the linearray module angle required to obtain the proposed coverage. It also allows to effectively check the safe installation of the line-array modules, by simulating the static behaviour of the fly-bars. For further information please refer to the DOWNLOADS section of www.dbtechnologies.com.









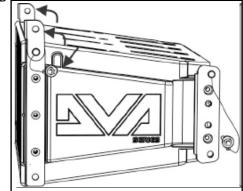


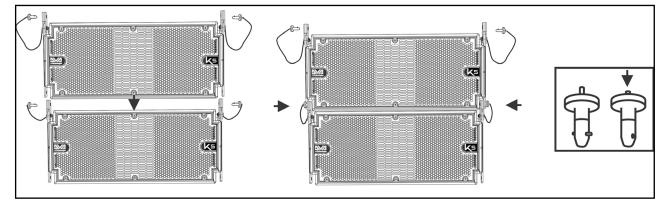
# INSTALLING DVA K5 IN A LINE-ARRAY CONFIGURATION

After defining the final line-array characteristics, and the required angle in particular, you can proceed with the installation. Please check that Audio Input Sensitivity is set on 0 dB

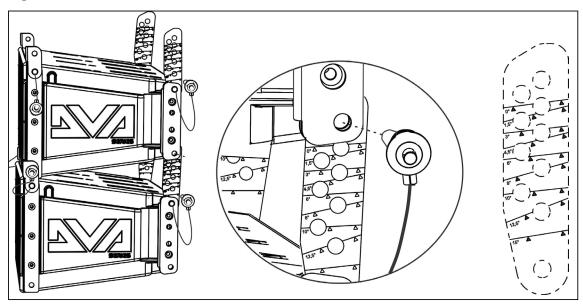
(common usage).

- Raise the front brackets of the lower module after extracting the pins from the cabinet.
- 2. Insert the upper module, aligning the brackets on the front side as shown.
- 3. Lock the 2 modules on the front side by inserting the relevant quick-release pins. The pin pressing/release movement is shown in the figure below.





- 4. While holding the upper module raised, raise the brackets on the rear side of the lower cabinet.
- 5. Insert the graduated rear brackets into the specified seats, at the desired angle. Fix them by inserting the relevant pins. The angle between the 2 installed modules is indicated by a line appearing just below the configuration. In the figure below, for example, the angle is 0°. Inclination can be set in steps of 1.5° in the 0° 6° range, in steps of 2° in the 6° 10° range and in steps of 2.5° in the 10° to 15° range.



# POWER SUPPLY CONNECTION AND LINKING

# POWER SUPPLY POWER SUPPLY AUTO-RANCE MORNING INPUT AUTO-RANCE MORNI

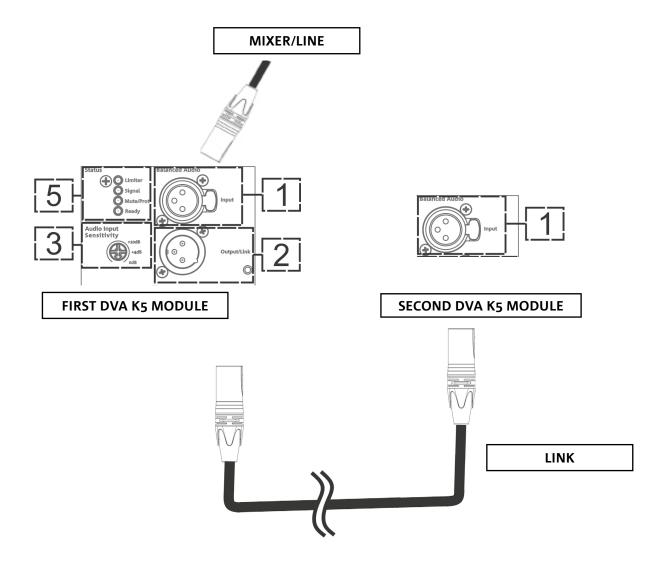
- Connect the first module power supply to AUTO-RANGE MAINS INPUT (7). For this purpose, use a cable equipped with a powerCON connector (not included in the supply).
- Extend the power supply from the first to the second module, by connecting the MAINS LINK OUTPUT (8) to the AUTO-RANGE MAINS INPUT (7), as shown in the figure.
- Repeat the operation between the second and the third module, and so on, until all line-array modules are connected (check the maximum number of power supply links in Technical Specifications).



#### ATTENTION!

- The amplifier nameplate of a DVA K5 module specifies the maximum and total current (and power) value of a multiple module system with extension connections.
- The cables must be properly sized and design, installation and system
  testing should exclusively be performed by qualified personnel. AEB
  Industriale accepts no responsibility in case of use of cables which
  are unsuitable, non-certified, non-compatible with the correct system
  sizing and the regulations in force in the country of use.

# INPUT CONNECTION AND EXTENSION



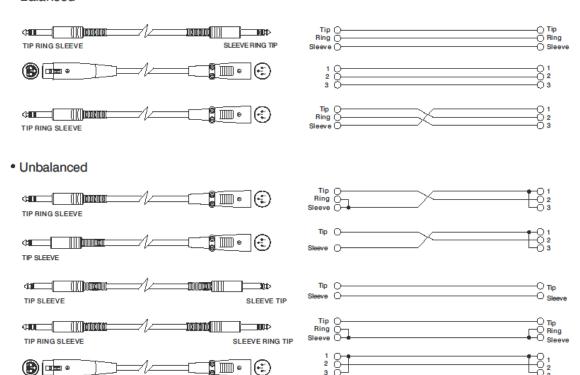
- Connect the cable from MIXER/LINE to the BALANCED AUDIO (1) input of the first line array module. For this purpose, use a cable equipped with an XLR connector (not included in the supply). For further information about the cables that are available please refer to the picture at p. 37.
- Extend the signal between the first and the second module. To this purpose connect the OUTPUT/LINK (2) output to the BALANCED AUDIO (1) input of the second module.
- Repeat the operation between the second and the third module, and so on, until all line-array modules are connected.



#### ATTENTION!

- Only use cables equipped with Neutrik® connectors
- Replace any damaged cables, to avoid malfunctions and poor sound quality.

#### \* Balanced



#### CONFIGURATION AND OPTIMISATION WITH DSP IN LINE-ARRAY

The use of a line-array provides multiple benefits in various contexts; in particular:

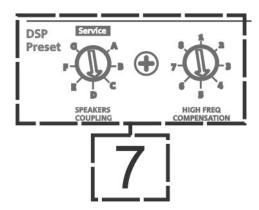
- Homogeneous SPL along the speaker front direction; the effect is particularly noticeable over medium to long distances
- directive sound behaviour, allowing to accurately focus the sound on the audience, avoiding unnecessary dispersions in large and reverberating environments

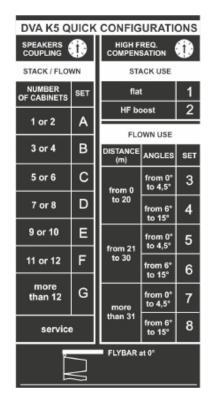
The line-array optimisation takes into account the system behaviour with respect to the frequency:

- as distance from the line-array increases, air attenuation increases as well. This particularly applies to high frequencies.
- as the angle of the line-array components increases, the effects associated with soundwave attenuation at medium frequencies increase as well.
- as the number of line-array modules increases the low frequency components becomes dominant

The DSP-managed control functions allow to optimise the line-array sound configuration of the DVA K5 modules. The user interface is simple and intuitive. It includes two rotary encoders installed in the "DSP Preset" (7) section and the reference label shown below:

- Turn the "SPEAKER COUPLING" rotary encoder to set the number of modules included in the line array. This rotary encoder affects the low frequencies and must be turned to the following position:
  - A 1 to 2 speakers
  - B 2 to 4 speakers
  - C 5 to 6 speakers
  - D 7 to 8 speakers
  - E 9 to 10 speakers
  - F 11 to 12 speakers
  - G 13 speakers and beyond





 Turn the "HIGH FREQUENCY COMPENSATION" rotary encoder according to the type of installation and angle set in the linearray. This rotary encoder affects the medium to high frequency sections and must be turned to the following position:

#### STACKED

- 1 installation in a stacked configuration (for example on subwoofer through the specially designed DRK-10 fly-bar), for an equalisation with no emphasis over the whole frequency range.
- 2 installation in a stacked configuration (for example on subwoofer through the specially designed DRK-10 fly-bar), for an equalisation emphasising high frequencies

#### **FLOWN**

- 3 installation in a flown configuration, with the audience
   0-20 m away and an angle between each module ranging between 0° and 4.5°
- 4 installation in a flown configuration, with the audience
   0-20 m away and an angle between each module ranging between 6° and 15°
- 5 installation in a flown configuration, with the audience 21-30 m away and an angle between each module ranging between 0° and 4.5°
- 6 installation in a flown configuration, with the audience
   21-30 m away and an angle between each module ranging between 6° and 15°
- 7 installation in a flown configuration, with the audience over 31 m away and an angle between each module ranging between 0° and 4.5°
- 8 installation in a flown configuration, with the audience over 31m away and an angle between each module ranging between 6° and 15°

# 3. INSTALLATION EXAMPLES

#### INSTALLATION ON TRIPOD STAND

DVA K5 can be installed on an optional standard tripod with a pole having a diameter of 35 mm. The DSA-4 accessory is required for this installation; you can mount up to 2 modules and the maximum permitted distance between the first element and the ground is 130 cm. DSA-4 allows a maximum inclination of  $\pm$  5°. For further information, please refer to the instructions of this accessory.

#### INSTALLATION ON SUBWOOFER WITH POLE

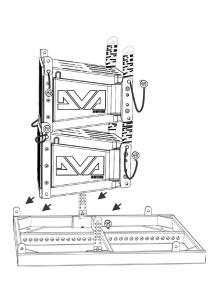
To install the modules on a subwoofer DVA KS10, DVA KS20, DVA S10DP or DVA S1518N you must use a pole having a diameter of 35 mm. For this type of installation, the distance between the speaker base and the floor must not exceed 85 cm, and you can mount up to 2 DVA K5 modules. To this purpose you need to use a DSA-4 accessory, and the downward inclination of the speakers must not exceed 5°.

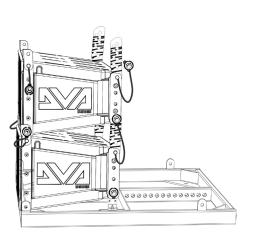
#### INSTALLATION ON A FLAT SURFACE

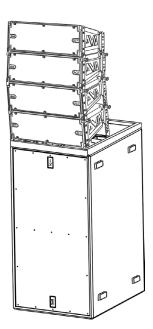
DVA K5 can be installed on a flat surface, using the DRK-10/DRK-20 fly-bars (max 6 modules) and the DSA-4 (max. 3 modules) accessory For further information please refer to the relevant manuals.

#### STACKED INSTALLATION ON SUBWOOFER THROUGH A FLY-BAR

Stacked modules can be directly installed on a subwoofer, using a DRK-10/DRK-20 fly-bar. For further information please refer to the relevant manuals.

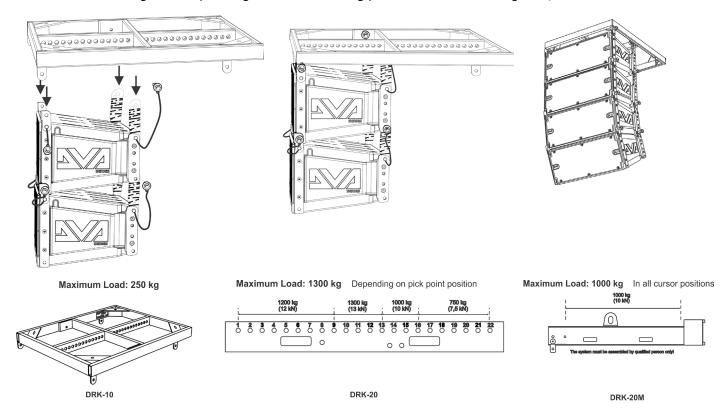






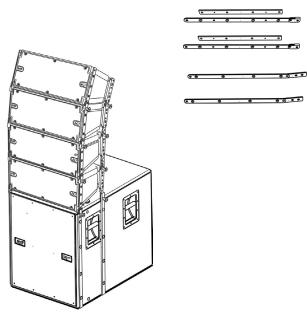
#### FLOWN INSTALLATION

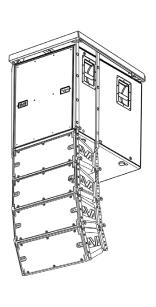
DVA K5 can be installed in a flown configuration, using the DRK-10 or DRK-20 (or DRK-20M) fly-bars. Proper installation and safety load limits can be verified with the help of dBTechnologies Composer. For further information please refer to the safety labels and to the relevant instructions for the fly-bars (DRK-10: 250 kg max, DRK-20: 1300 kg max, depending on the connecting point, DRK-20M: 1000 kg max).



#### FLOWN OR STACKED INSTALLATION WITH SIDE SUPPORTS

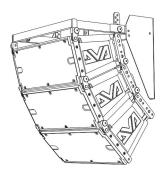
DVA K5 can be directly mounted on a DVA KS10 subwoofer in a stacked configuration, or in a flown configuration under a DVA KS10, as shown in the figure, using the optional SRK-10 accessory.





# INSTALLATION WITH WALL BRACKET

DVA K5 can be wall-mounted, using the optional DWB 3 bracket. The further mechanical accessories required for bracket installation are not included.



# **USE OF DRL-45 LIFTING EQUIPMENT**

DVA K5 can be lifted using DRL-45 lifting equipment. The line-array to be lifted must use a properly installed DRK-10 fly-bar.



#### ATTENTION!

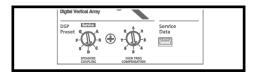
- Never use the speaker handles, brackets or other components to hang the system!
- When used outdoors, anchor the speaker to prevent any oscillations due to atmospheric agents and wind.

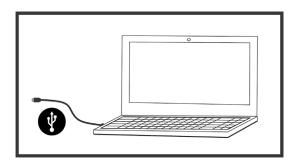
For safe use of accessories, periodically check their functionality and integrity before using them.

Accessories must be used by qualified personnel only! Make sure the installation is stable and safe, to avoid any hazard to people, animals and/or property. The user must verify the binding safety regulations and laws in force in the Country where the product is being used. When installing the product follow the instructions provided herein.

# 4. FIRMWARE UPDATES

IT IS very important to keep product firmware updated to the latest version to ensure full performance. Please check site http://www.dbtechnologies.com for updates under section "DOWNLOADS" periodically.





- 1. Download USB BURNER MANAGER from section "SOFTWARE & CONTROLLER" of the dBTechnologies site.
- 2. Download the .zip file with the last firmware from section "DOWNLOADS" for your product
- 3. Connect the product to the PC by means of a USB cable (not supplied) featuring the right connector detail is contained in section FEATURES OF THE AMPLIFIER AND CONTROL SECTIONS
- 4. In the top right corner of the USB BURNER MANAGER screen, select "File Opening".
- 5. Select the firmware file you have downloaded previously (ensure that it is suitable for your operating system).
- 6. Follow the on-screen instructions.
- 7. Click UPDATE.

# 5. TROUBLESHOOTING

The speaker doesn't turn on:

- 1. Check that the power supply upstream of the system is working properly
- 2. Check that the power cord is properly plugged
- 3. Check that the ON/OFF selector is turned to "I".

The speaker turns on but it doesn't output any sound:

- 1. Check that the input connections of the main audio signal and of the auxiliary one, if any, have been performed properly
- 2. Check that the cables in use are not damaged
- 3. Check that the mixer or the audio source are on and that they clearly indicate the presence of an output signal to the speaker.
- 4. Check that the level of the main audio volume and of the auxiliary one, if any, are set to an appropriate value.

#### The speaker outputs a distorted sound:

- 1. Check that the Audio Input Sensitivity rotary encoder is set on the correct value (0 dB). It should be noted that if the LIMITER LED is on, it indicates the speaker is operating under distorting conditions.
- 2. Check that the cables in use are not damaged; should that be the case, replace them (a damaged cable may result in a signal loss or alteration).
- 3. Check that the LINE-MIC switch matches the actual input connection.
- 4. Check the settings of the rotary encoder DSP preset affecting the output frequency response. To this purpose please refer to section FIRST SWITCH-ON.

# 6. TECHNICAL SPECIFICATIONS DVA K5

# **GENERAL**

Type:	3-way active line-array module
-------	--------------------------------

# **ACOUSTIC DATA**

Frequency response [± 3 dB]:	70 - 19000 Hz
Max SPL:	129 dB
HF:	2x 1" (Voice coil:1.4")
Туре НГ:	Ceramic
MF:	1x 6.5" (Voice coil: 2")
LF:	1x 8" (Voice coil: 2.5")
Type MF- LF:	Neodymium
Crossover frequency:	340 Hz (Low/Mid), 1800 Hz (Mid/High)
Directivity (HxV):	100°x15° (single module)

# **AMPLIFIER**

Type:	Digipro® G3
Amplification class:	D class
Amplification power (Peak)	1000 W
Amplification power(RMS):	500 W
Power supply:	SMPS with PSU Auto-range
Power supply connector:	(PowerCON In/Link)
Cooling technique:	Convection

# **PROCESSOR**

Internal controller:	DSP 25/56 bit/48 kHz
Advanced functions:	FIR filters
Limiter:	Peak, Thermal

# **USER INTERFACE**

Controls:	Sensitivity control, 2 8-position rotaries
Led	Limiter, Signal, Mute/prot, Ready

# **INPUTS AND OUTPUTS**

Power supply inputs and links:	PowerCON In/Link
Audio input:	1x XLR IN, balanced
USB:	1x USB MINI, type B
Audio output:	1x XLR link OUT, balanced

# **POWER SUPPLY SPECIFICATIONS**

Draw at 1/8 of full power in average use conditions (*):	0,72 A / 76 W (230 V) - 1,22 A / 70 W (110 V)
Draw at 1/3 of full power in maximum use conditions (**):	1,25 A / 140 W (230 V) - 2,12 A / 144 W (110 V)
Draw with speaker turned on without signal (idle): :	19 W
Inrush current:	18.3 A
Total current and power allowed in daisy-chain configuration:	14 A / 3200 W max (220 V) - 11 A / 3200 W max (110 V)

<sup>\*</sup> INSTALLER NOTES: The values refer to 1/8 of full power, in average operating conditions (music program with infrequent or no clipping). It is recommended to consider them the minimum sizing values for any type of configuration.

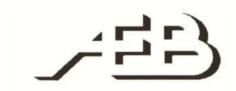
# **DIMENSIONS**

Material:	metal-reinforced polypropylene
Grid:	NC machining
Handles	built-in

<sup>\*\*</sup> INSTALLER NOTES: The values refer to 1/3 of full power, in heavy operating conditions (music program with frequent clipping or activation of the limiter). We recommend sizing according to these values in case of professional installations and tours.

Connecting points:	built into the cabinet
Direct installation on pole:	No, with accessories only
Width:	580 mm (22.83 inch.)
Height:	240 mm (9.45 inch.)
Depth:	327 mm (12.87 inch.)
Weight:	14,7 kg (32,41 lbs)

The characteristics, specifications and appearance of the products are subject to change without warning. dBTechnologies reserves the right to make any change or improvement to product design or manufacturing without undertaking any obligation to also change or improve the previously manufactured products.



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