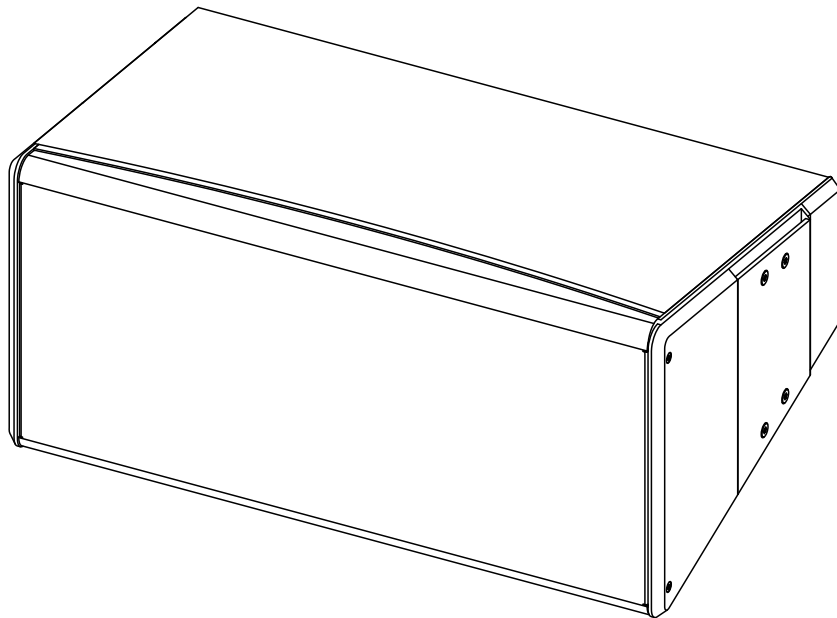


10AL/10AL-D Manual (1.2 EN)



General information

10AL/10AL-D Manual

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Keep this manual with the product or in a safe place so that it is available for future reference.

When reselling this product, hand over this manual to the new customer.

d&b audiotechnik GmbH
Eugen-Adolff-Strasse 134, D-71522 Backnang, Germany
T +49-7191-9669-0, F +49-7191-95 00 00
docadmin@dbaudio.com, www.dbaudio.com

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1. Safety precautions

1.1. Information regarding the use of loudspeakers

Potential risk of personal injury

Never stand in the immediate vicinity of loudspeakers driven at a high level. Professional loudspeaker systems are capable of causing a sound pressure level detrimental to human health. Seemingly non-critical sound levels (from approx. 95 dB SPL) can cause hearing damage if people are exposed to it over a long period.

In order to prevent accidents when deploying loudspeakers on the ground or when flown, please take note of the following:

- When setting up the loudspeakers or loudspeaker stands, make sure they are standing on a firm surface. If you place several systems on top of one another, use straps to secure them against movement.
- Only use accessories which have been tested and approved by d&b for assembly and mobile deployment. Pay attention to the correct application and maximum load capacity of the accessories as detailed in our specific "Mounting instructions" or in our "Flying system and Rigging manuals".
- Ensure that all additional hardware, fixings and fasteners used for installation or mobile deployment are of an appropriate size and load safety factor. Pay attention to the manufacturers' instructions and to the relevant safety guidelines.
- Regularly check the loudspeaker housings and accessories for visible signs of wear and tear, and replace them when necessary.
- Regularly check all load bearing bolts in the mounting devices.

Potential risk of material damage

Loudspeakers produce a static magnetic field even if they are not connected or are not in use. Therefore make sure when erecting and transporting loudspeakers that they are nowhere near equipment and objects which may be impaired or damaged by an external magnetic field. Generally speaking, a distance of 0.5 m (1.5 ft) from magnetic data carriers (floppy disks, audio and video tapes, bank cards, etc.) is sufficient; a distance of more than 1 m (3 ft) may be necessary with computer and video monitors.

2. 10AL/10AL-D loudspeaker

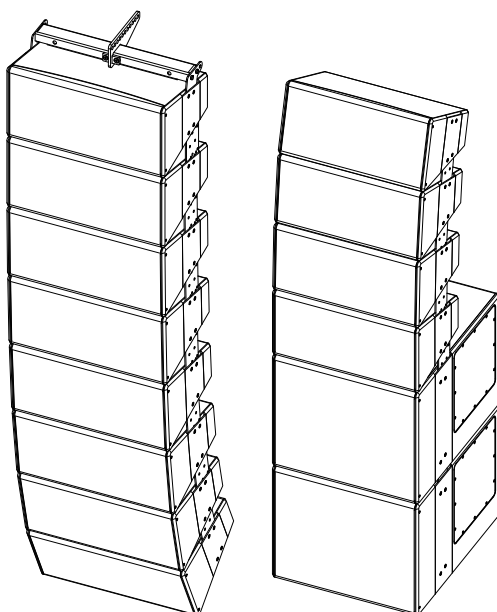
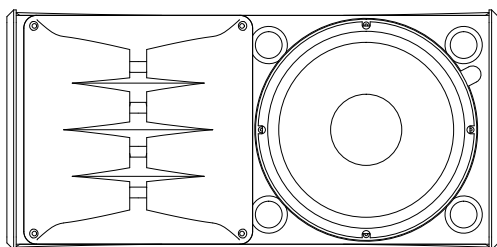


Fig. 1: 10AL loudspeaker

Rigging examples:

10AL Line array, 8 deep, with Z5415 Flying bar adapter xA, Z5414 Flying bar xA, Z5413 Flying bar connector plate xA and Z5417 Connector plate 10AL.

Ground stack consisting of 10AL and 27A-SUB loudspeakers with Z5417 Connector plate 10AL and Z5418 Connector plate xA-SUB.

2.1. Product description

The 10S, 10A and 10AL and their "D versions" are a family of high performance 2-way loudspeakers employing a single 10" driver in a bass-reflex enclosure and different HF sections for a wide range of installed sound applications. All models are lightweight passive designs using neodymium drivers and large horns for accurate pattern control.

The 10AL and 10AL-D loudspeakers are the line array modules of this family. They provide constant directivity HF line sources with either 75° or 105° horizontal coverage using dual 1" exit drivers. The cabinets are equipped with an integrated rigging system for the design of vertical arrays providing application specific dispersion characteristics.

With a frequency response extending from 60 Hz to 18 kHz, the cabinets can be used as full range systems or supplemented by different subwoofers of the xS- or xA-Series.

The enclosures are constructed from marine plywood with an impact resistant black paint finish. The fronts of the cabinets are protected by a rigid metal grill backed by an acoustically transparent foam.

The cabinets are Ball Impact Resistant according to DIN 18032-3.

Rigging components

10AL/10AL-D cabinets are connected to form a vertical array each using the Z5417 Connector plates 10AL. Possible splay angle settings between adjacent cabinets are 0°, 1°, 2°, 4°, 6°, 9°, 12° and 15°. A vertical array may consist of up to 9 cabinets. Up to two 18A or 27A subwoofers can be integrated into the array limiting the maximum number of 10AL/10AL-D cabinets to 6.

Vertical arrays are supported using the Z5414 Flying bar xA and a pair of Z5413 Flying bar connector plates xA.

Note: For approved configurations as well as safety and mounting instructions, refer to the respective rigging manual.

Cabinet options

The weather resistant version (WR) is suitable for outdoor use (IP34, vertical aiming up to +15°). The cabinets have an impact and weather protected black PCP (Polyurea Cabinet Protection) finish.

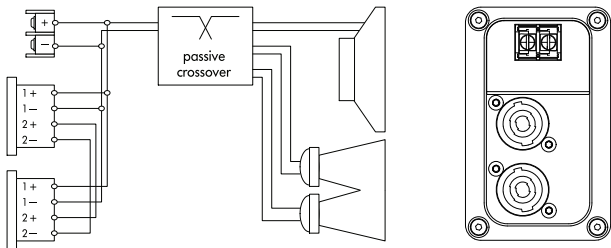


Fig. 2: Connector wiring

2.2. Connections

The cabinets are fitted with a pair of NL4 connectors and a two pole screw terminal block (ST). All four pins of both NL4 connectors are wired in parallel. The cabinets use the pin assignments 1+/1-. Pins 2+/2- are designated to active subwoofers.

Cabinets with the weather resistant option (WR) are equipped with a fixed input cable (PG type, H07-RN-F, 2 x 2.5 mm² (AWG 13), standard length 5.5 m (18 ft).

Pin equivalents of the applicable connector options are listed in the table below.

NL4	1+	1-	2+	2-
ST	+	-	n.a.	n.a.
PG	Brown (+)	Blue (-)	n.a.	n.a.

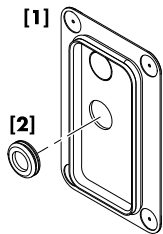


Fig. 3: Cover plate and rubber grommet

Fixed cable connection

The 10AL and 10AL-D loudspeakers are each supplied with a cover plate [1] and a rubber grommet feed through [2]. For indoor operation, these items can be used to hide the connector panel, if required. For unprotected outdoor operation, the connector panel must be covered, i.e. both items must be used to achieve an IP degree of protection of IP34.

To install the fixed cable connection, proceed as follows:

Tools required: Philips screw driver (#PH2).

1. Prepare the rubber grommet and the connection cable.
2. Remove the knockout opening in the cover plate and attach the rubber grommet correspondingly.
3. Insert the connection cable through the rubber grommet and connect the cable wires to the screw terminal.
⇒ Observe the correct polarity!
4. Undo the four screws of the connector panel.
5. Push the cover plate towards the connector panel until it fits into place.
6. Finally fix the cover plate together with the connector panel using the four screws.

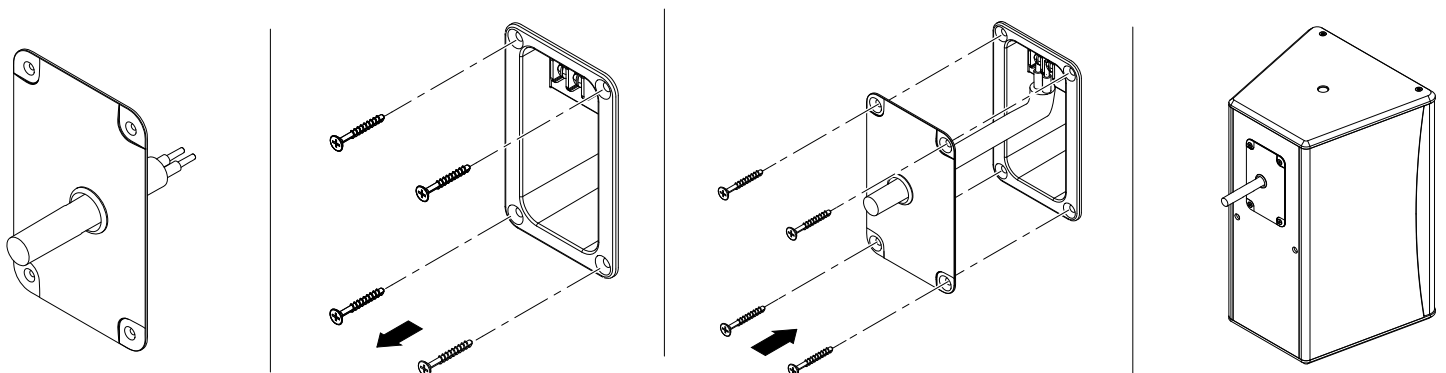


Fig. 4: Installing the fixed cable connection

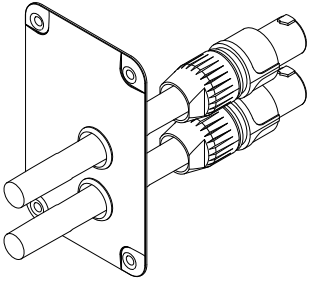


Fig. 5: NL4 cable connection with cover plate [1]

NL4 connection with cover plate

The two NL4 connector sockets of the cabinet's connector panel are located in a recess to allow the use of the cover plate [1] together with NL4 cable connectors, as shown in the graphic opposite.

Note: Neutrik NL4FC type connectors must be used for this option.

The cover plate is equipped with two knockout openings to allow daisy chaining of the loudspeaker.

To use the NL4 connection, proceed in the same manner as described above in the section entitled ⇒ "Fixed cable connection" on page 6.

2.3. Operation

NOTICE!

Only operate d&b loudspeakers with a correctly configured d&b amplifier, otherwise there is a risk of damaging the loudspeaker components.

Operation with D6 or D12

Select the controller setup 10AArc or 10ALin for 10AL loudspeakers.

Select the controller setup 10ADArc or 10ADLin for 10AL-D loudspeakers.

Within the D12 amplifier they are available in "Dual Channel" or "Mix TOP/SUB" mode. For combinations with active subwoofers fed by a single 4-wire cable "Mix TOP/SUB" mode must be selected.

Up to a total of three 10AL or 10AL-D loudspeakers can be driven by each channel of the D6 or D12 amplifiers.

"Arc" and "Line" setups

The selection of "Arc" or "Line" depends on the curvature of the array. Both setups may be used within one array.

The "Arc" setup is intended for line array loudspeakers when used in curved array sections.

The "Line" setup is used for long throw array sections with three or more consecutive splay settings of 0°, 1°, 2° or 4. Compared to the "Arc" setup, the upper mid range is reduced to compensate for the extended near field.

The transition from "Line" to "Arc" configuration within the array is made according to the splay progression but may allow for certain deviations due to the wiring of the cabinets in groups of up to three.

2.3.1. Controller settings

For acoustic adjustment the functions CUT, HFC and CPL can be selected.

CUT circuit

Set to CUT, the cabinet low frequency level is reduced. The cabinets are now configured for use with d&b active subwoofers.

HFC circuit

Selecting the HFC (High Frequency Compensation) circuit compensates for loss of high frequency energy due to absorption in air when loudspeakers are used to cover far field listening positions.

The HFC circuit has two settings (HFC1, HFC2) for different distance ranges the cabinets have to cover. The settings should be used selectively, only for those cabinets covering the respective distances, HFC1 for distances larger than 25 m (80 ft) and HFC2 for distances larger than 50 m (160 ft).

The compensation is adjusted for a typical relative humidity of 40 %. With lower humidity the absorption by air increases therefore the distances where the respective HFC setting provides a correct equalization are shorter than indicated above.

Using the HFC function provides the correct sound balance between close and remote audience areas, whilst all amplifiers driving the array can be fed with the same signal.

CPL circuit

The CPL (Coupling) circuit compensates for coupling effects between the cabinets of an array. CPL begins gradually around 1 kHz, with the maximum attenuation below 200 Hz. As coupling effects increase with the length of the line array, the CPL circuit can be set to dB attenuation values between 0 and -9. With higher attenuation values the corner frequency of the filter shifts towards lower values.

Positive CPL values create an adjustable low frequency boost (0 to +5 dB) and can be set when the system is used in full range mode without subwoofers.

Note: Make sure that all cabinets within the line array are operated with the same CPL setting.

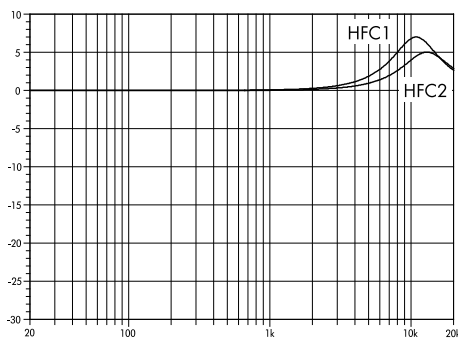


Fig. 6: Frequency response correction of HFC circuit

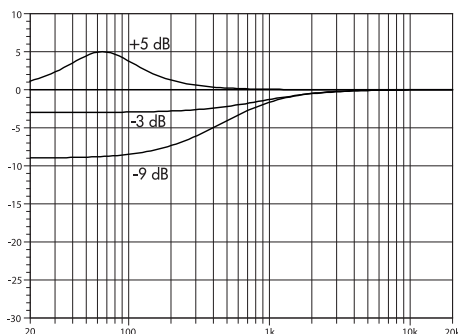


Fig. 7: Frequency response correction of CPL circuit

2.4. Dispersion characteristics

The following graphs show dispersion angle over frequency of a single cabinet plotted using lines of equal sound pressure (isobars) at -6 dB and -12 dB.

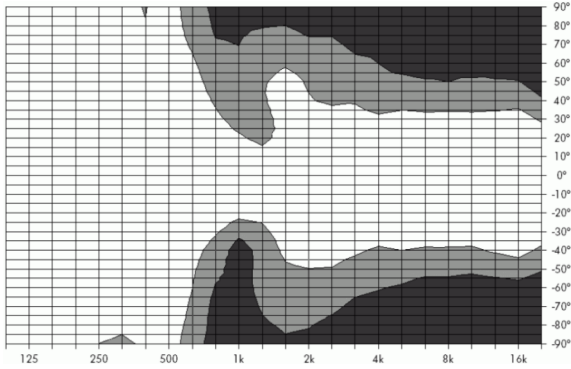
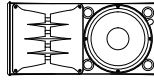


Fig. 8: Isobar diagram horizontal



10AL

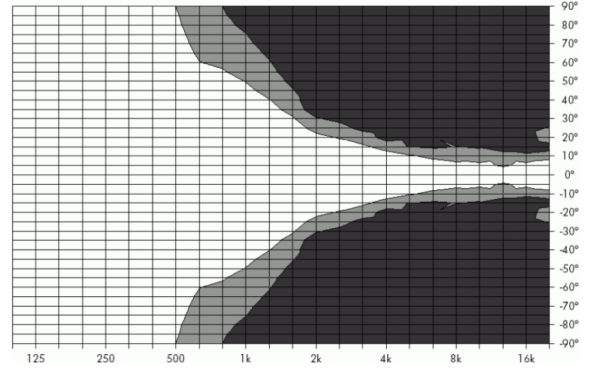


Fig. 9: Isobar diagram vertical

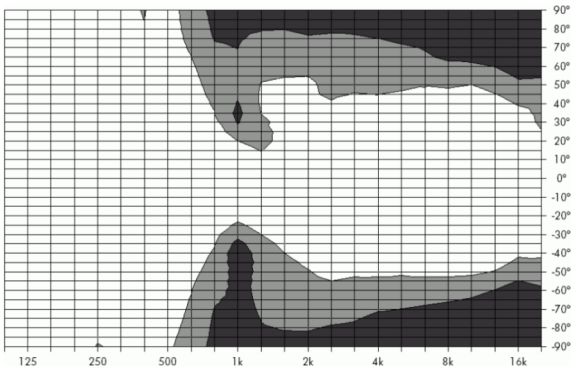
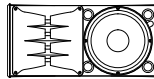


Fig. 10: Isobar diagram horizontal



10AL-D

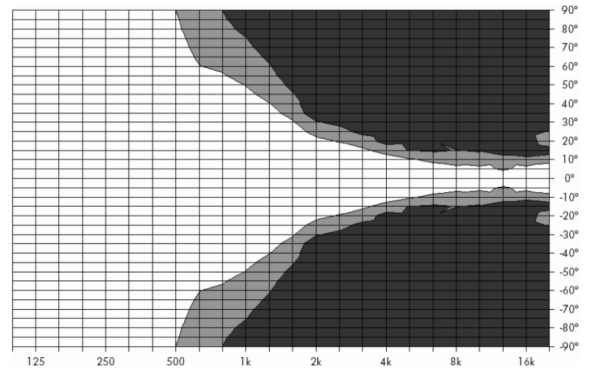


Fig. 11: Isobar diagram vertical

2.5. Technical specifications

10AL/10AL-D system data

Frequency response (-5 dB standard)	60 Hz - 18 kHz
Frequency response (-5 dB CUT mode)	110 Hz - 18 kHz
Max. sound pressure 1 m, free field).....	
10AL with D6/D12	130 dB/133 dB
10AL-D with D6/D12.....	129 dB/132 dB
.....(SPLmax peak, pink noise test signal with crest factor of 4)	
Input level (100 dB-SPL/1 m).....	-16 dBu

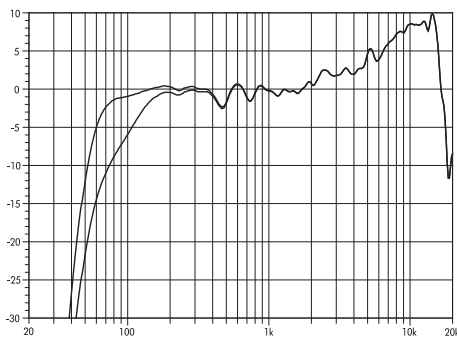


Fig. 12: 10AL frequency response, standard and CUT modes

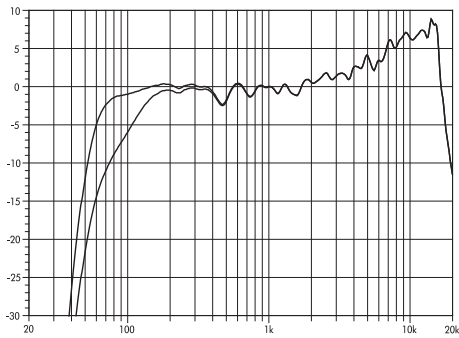


Fig. 13: 10AL-D frequency response, standard and CUT modes

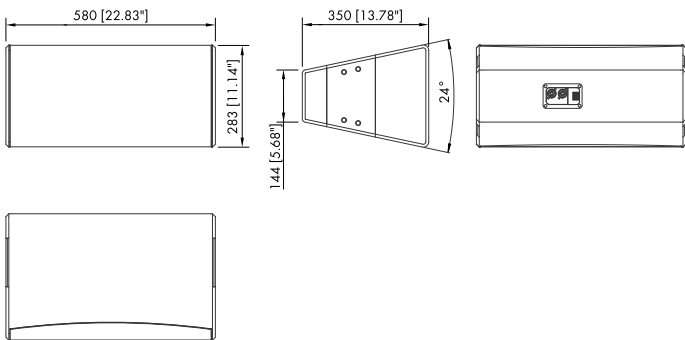


Fig. 14: 10AL/10AL-D cabinet dimensions in mm [inch]

10AL/10AL-D loudspeaker

Nominal impedance.....	12 ohms
Power handling capacity (RMS/peak 10 ms).....	200/1200 W
Nominal dispersion angle (horizontal) 10AL.....	75°
Nominal dispersion angle (horizontal) 10AL-D.....	105°
Splay angle setting.....	0°, 1°, 2°, 4°, 6°, 9°, 12°, 15°
Components.....	10" driver with neodymium magnet
.....	2 x 1" exit compression drivers
.....	Passive crossover network
Connections.....	2 x NL4
.....	1 x screw terminal (ST - up to 4 mm ² /AWG 11)
Optional fixed cable (PG):	
.....	H07-RN-F, 2 x 2.5 mm ² (AWG 13), 5.5 m (18 ft)
Pin assignment.....	NL4: 1+/1-
.....	Fixed cable (PG): brown + / blue -
Weight.....	14 kg (31 lb)

3. Manufacturer's Declarations



3.1. EU conformity of loudspeakers (CE symbol)

This declaration applies to:

d&b 10AL loudspeaker, Z1557

d&b 10AL-D loudspeaker, Z1558

manufactured by d&b audiotechnik GmbH.

All production versions of these types are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective EC directives including all applicable amendments.

A detailed declaration is available on request and can be ordered from d&b or downloaded from the d&b website at www.dbaudio.com.

3.2. WEEE Declaration (Disposal)

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, please contact d&b audiotechnik.

