Q10

Manual (1.3E)

d&b audiotechnik

References in the manual



WARNING! — **This refers to a potentially dangerous situation which may lead to personal injury.**

CAUTION! — **This refers to a potentially dangerous situation which may lead to personal injury.**

IMPORTANT! — **This refers to a situation which may cause the equipment to malfunction.**

Note: — **Additional information and/or references**

Symbols on the equipment



Please refer to the information in the operating manual.



WARNING!
Dangerous voltage!

General Information

Q10 Manual

Version 1.3E, 11/2004, D2043.E.01

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The information contained in this manual has been carefully checked for accuracy, at the time of going to press, however no guarantee is given with respect to the correctness.

d&b audiotechnik AG accepts no responsibility for any errors or inaccuracies that may appear in this manual or the products and software described in it.

Technical specifications, dimensions, weights and properties do not represent guaranteed qualities.

As manufacterers we reserve the right to make alterations and modifications within the framework of legal provisions, as well as changes aimed at improving quality.

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Safety precautions

Before you use our products, read the manual carefully and observe all the safety precautions. They will protect you and help to avoid equipment failures.

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

If you supply d&b products, please draw the attention of your customers to these safety guidelines. Enclose the relevant manuals with the systems. If you require additional manuals for this purpose, you can order them from d&b.

Information regarding use of loudspeakers



WARNING!

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.

CAUTION!

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.

Q10

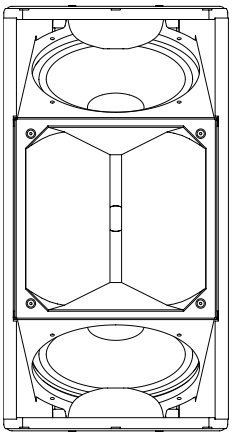


Fig. 1: Q10 loudspeaker

The Q10 is a 110° x 40° passive two-way loudspeaker. It houses 2 x 10" LF drivers and a 1.3" HF compression driver with a rotatable CD horn and a passive crossover network. Its frequency response extends from 60 Hz to above 17 kHz. The two 10" neodymium LF drivers are positioned in a dipolar arrangement providing exceptional vertical dispersion control even at lower frequencies.

The Q10 cabinet is constructed from marine plywood and has an impact resistant paint finish. The front of the loudspeaker cabinet is protected by a rigid metal grill, covered with a replaceable acoustically transparent foam. The cabinet incorporates a pair of handles.

The Q10 cabinet is fitted with four types of rigging device:

- Eight sockets in the front grill and rear edge bar, that accept the Z5153 Locking pins 8 mm, to connect the array links.
- A quick lock adapter plate on one side of the cabinet that accepts the Z5150 Q Swivel bracket or the Z5156 Q Flying adapter.
- Five sockets that accept the Z5048 Flying pin 10 mm for supporting single cabinets and for the aiming of arrays.
- Four M10 threaded inserts to accept the Z5020 Flying adapter 02, Z5025 Flying adapter 03 or Z5043 MAX Horizontal bracket.

CAUTION!

Only operate Q10 loudspeakers with a d&b amplifier configured for the Q10 otherwise there is a risk of damage to the loudspeaker components.

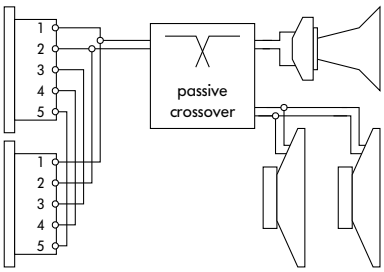


Fig. 2: Connector wiring

Connections

The Q10 cabinet is fitted with a pair of EP5 connectors. All five pins of both connectors are wired in parallel. The Q10 uses the pin assignments 1/2. Pins 3/4 and 5 are designated to Q-SUB active subwoofers, where pin 5 is used for SenseDrive (only available when using a D12 amplifier and 5-wire cabling). Using the male connector as the input, the female connector allows for direct connection to additional loudspeakers.

The Q10 can be supplied with NL4 output connectors as an option. Pin equivalents of EP5 and NL4 connectors are listed in the table below.

EP5	1	2	3	4	5
NL4	1+	1–	2+	2–	n.a.

Tab. 1: EP5 and NL4 pin assignments

Operation with D12

IMPORTANT!

Selecting Q10 mode in the D12 enables up to two Q10 loudspeakers to be driven by the respective channel. In applications with low continuous levels or low ambient temperatures up to three cabinets can be connected.

Controller settings

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

CUT circuit
Set to CUT, the Q10 low frequency level is reduced. The Q10 is now configured for use with the Q-SUB or d&b C-Series subwoofers.

HFA circuit
In HFA mode (High Frequency Attenuation), the HF response of the Q10 system is rolled off. The HFA provides a natural, balanced frequency response when a unit is placed close to listeners in near field or delay use.

High Frequency Attenuation begins gradually at 1 kHz, dropping by approximately 3 dB at 10 kHz. This roll-off mimics the decline in frequency response experienced when listening to a system from a distance in a typically reverberant room or auditorium.

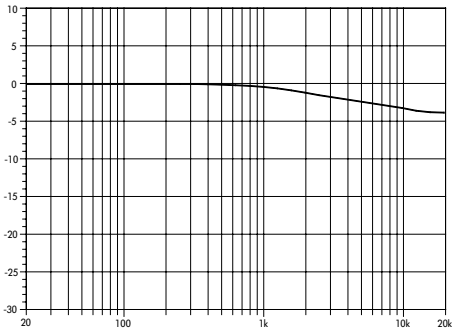


Fig. 3: Frequency response correction of HFA circuit

CPL circuit
The CPL (Coupling) circuit compensates for coupling effects between the cabinets when building closely coupled arrays. CPL begins gradually at 1 kHz, with maximum attenuation below 400 Hz, providing a balanced frequency response when Q10 cabinets are used in arrays of two or more. The function of the CPL circuit in the D12 amplifier is shown in the diagram opposite and can be set in dB attenuation values between –9 and 0, or a positive CPL value which creates an adjustable low frequency boost around 65 Hz (0 to +5 dB).

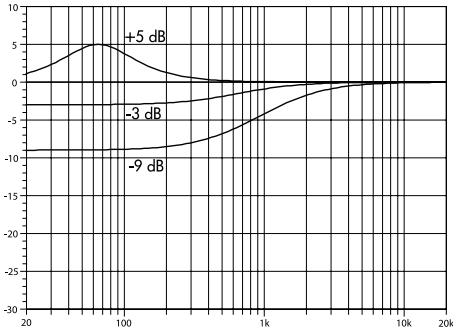


Fig. 4: Frequency response correction of CPL circuit

Operation with E-PAC

Selecting Q10 mode enables the E-PAC to drive one Q10 loudspeaker. LO IMP mode configures the E-PAC to drive a maximum of two Q10 loudspeakers with a 6 dB reduction in input level to the loudspeakers.

For acoustic adjustment the functions CUT and CPL can be selected. The E-PAC CPL circuit creates a 3 dB attenuation corresponding with the –3 dB curve shown in Fig. 4.

Dispersion characteristics

The graphs below show dispersion angle over frequency of a single Q10 cabinet plotted using lines of equal sound pressure (isobars) at –6 dB and –12 dB.

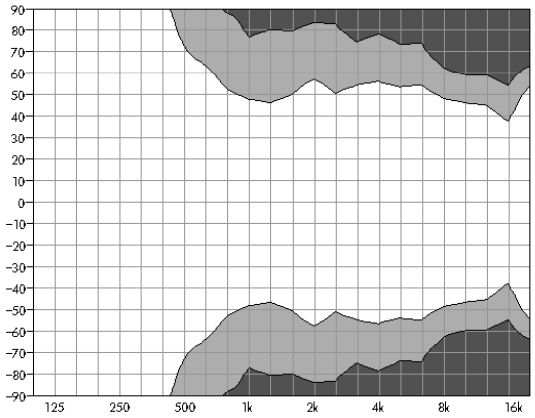
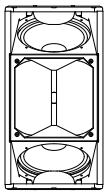


Fig. 5: Isobar diagram Q10 horizontal, standard set up



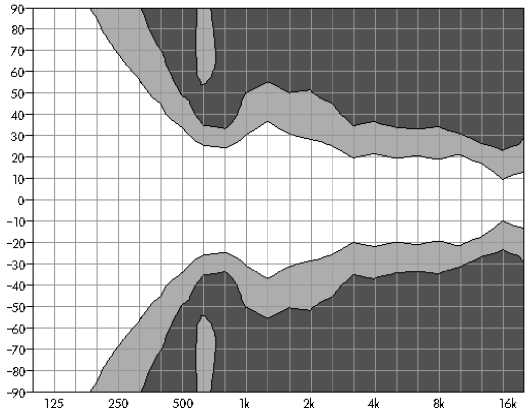


Fig. 6: Isobar diagram Q10 vertical, standard set up

Horizontal set up with the horn rotated

Note:

Please note that in the standard upright configuration the Q10 has a very accurate 110° horizontal constant directivity behavior that is maintained down to approximately 800 Hz, see Fig. 5.

This performance differs considerably when the cabinet is deployed horizontally with the horn rotated. Fig. 7 illustrates this and clearly shows the narrowing of the horizontal despersion below 1 kHz as a result of the dipole arrangement of the low drivers. Extreme care should therefore be taken when the Q10 is configured in this manner to ensure adequate coverage is obtained.

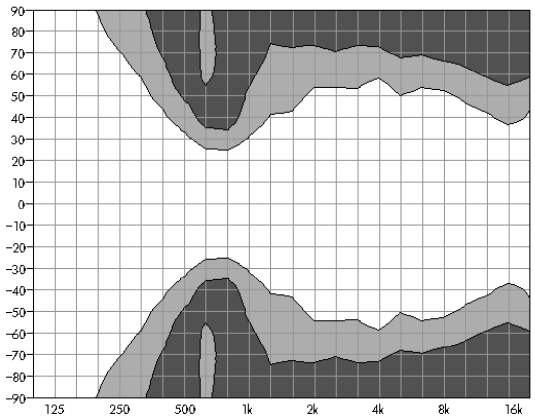
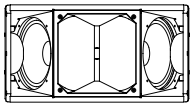


Fig. 7: Isobar diagram Q10 horizontal, horizontal set up with the horn rotated



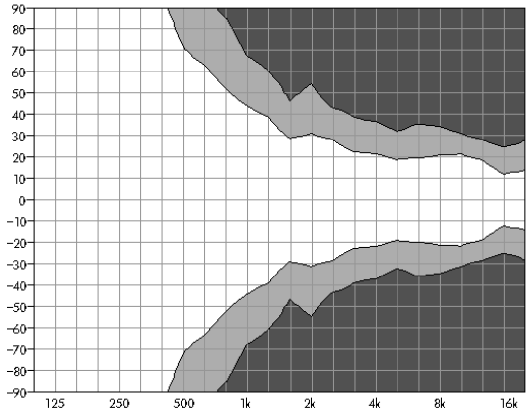


Fig. 8: Isobar diagram Q10 vertical, horizontal set up with the horn rotated

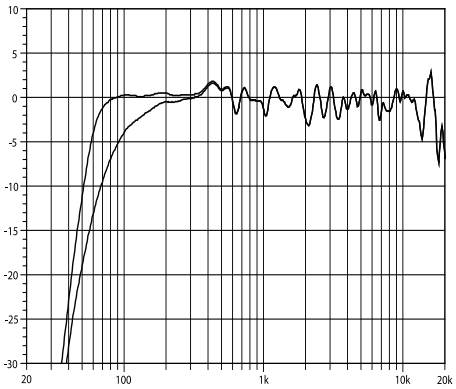


Fig. 9: Q10 frequency response, standard and CUT settings

Technical specifications

Q10 system data

Frequency response (–5 dB standard).....60 Hz ... 17 kHz
Frequency response (–5 dB CUT mode).....100 Hz ... 17 kHz
Max. sound pressure (single cabinet, 1 m, free field) with D12 .....137 dB
Max. sound pressure (single cabinet, 1 m, free field) with E-PAC .....133 dB
(SPLmax peak, pink noise test signal with crest factor of 4)

Input level (100 dB-SPL/1 m).....–17 dBu
Polarity to controller INPUT (XLR pin 2: +/3: –).....LF: +/HF: –

Q10 loudspeaker

Nominal impedance.....8 ohms
Power handling capacity (RMS / peak 10 ms).....400/1600 W
Nominal dispersion angle (hor. x vert.).....110° x 40°
Components.....2 x 10" driver
.....1.3" compression driver
.....Passive crossover network
Connections.....2 x EP5
.....(optional 2 x NL4)
Pin assignments.....EP5: 1/2
.....NL4: 1+/1–
Weight.....22 kg (49 lb)

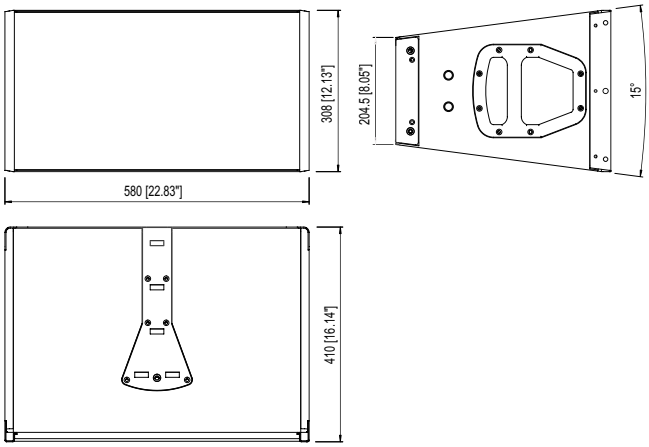


Fig. 10: Q10 cabinet dimensions in mm [inch]

Altering the HF horn dispersion

The Q10 HF horn has a square flange allowing it to rotate through 90°. It can easily be accessed through an aperture in the front grill. A label (Fig. 11) on the horn flare helps to easily identify the orientation of the horn.

The horn is secured against falling out internally via a steel wire. To rotate the horn undo the four countersunk Allen screws (M5 x 22) that hold the horn in place using a 3 mm Allen key. The horn can then be rotated through 90° and refastened (Torque setting 2 Nm).

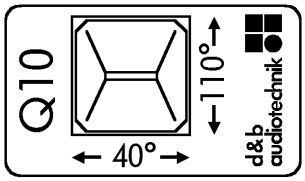


Fig. 11: Q10 horn dispersion label

Arraying Q10 cabinets

Horizontal array of Q10 cabinets

The horizontal angle between adjacent Q10 cabinets can be set to between 60° and 90°. The most even energy distribution is achieved with 75°.

Vertical array of Q10 cabinets

The vertical angle between adjacent Q10 cabinets can be set to between 20° and 40°. The most even energy distribution is achieved with 35°. Smaller angles between the cabinets will give a smaller coverage area but will produce higher sound pressure on the centre axis of the array.

Q10 used in line array columns with Q1s and Q-SUBs

The Q10 with the horn rotated can be positioned at the bottom of a Q1 line array column to horizontally and vertically extend the near field coverage, if required. Using the standard Q1 array links to connect the Q10 cabinet the splay should be set to maximum 14°.

EU declaration of conformity (CE symbol)

CE

EU conformity of loudspeakers

This declaration applies to loudspeakers manufactured by d&b audiotechnik AG and includes the types listed in the table below:

- **Q10 loudspeaker Z0508**

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 following EC directives including all applicable amendments:

- **89/336 Electromagnetic Compatibility**

The following standards have been applied:

- **DIN EN 55013:08-1991**
- **DIN EN 55020:05-1995**
- **DIN EN 50082-1:03-1993**

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