# Q1

## Manual (2.3 EN)

d&b audiotechnik

## Symbols on the equipment

**Please refer to the information in the operating manual.**

**WARNING!**
**Dangerous voltage!**

## Contents



## General Information

Q1 Manual


Version 2.3 EN, 06/2010, D2040.EN .02




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.

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


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# Safety precautions

## 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.

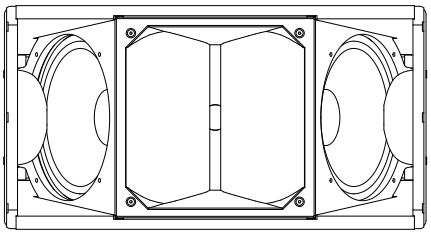

**Fig. 1: Q1 loudspeaker**

The Q1 is the Q-Series line array loudspeaker. It is used in vertical columns giving a 75° constant directivity dispersion pattern in the horizontal plane. The Q1 cabinet is a passive two-way design that houses 2 x 10" LF drivers and a 1.3" HF compression driver with a toroidal wave shaping device 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 an exceptional dispersion control even at lower frequencies, with the 75° nominal dispersion angle being maintained down to 400 Hz.

The Q1 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 side panels incorporate a pair of handles.

The Q1 cabinet is fitted with three types of rigging devices:

- 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 Z5156 Q Flying adapter.
- Five sockets that accept the Z5048 Flying pin 10 mm to support single cabinets and to secure the aiming of an array.

## Q-Series rigging components
## Q-Series arrays

A detailed description of the Q-Series rigging components is given in the Q-Series Rigging manual which is provided with the Z5159 Q Flying frame and the Z5156 Q Flying adapter.

A detailed description of planning and designing Q arrays is given in the technical information "TI 385 J, Q and T-Series system design, d&b ArrayCalc" which is also provided with the Z5159 Q Flying frame and Z5156 Q Flying adapter.

The d&b ArrayCalc array calculator can be downloaded from the d&b website at www.dbaudio.com.

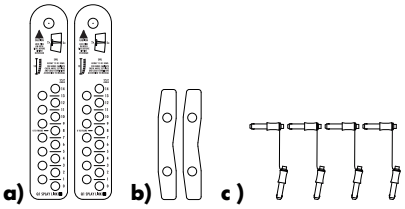


**Fig. 2: Z5154 Q Rigging set**

### Z5154 Q Rigging set

The Z5154 Q Rigging set is supplied with the Q1 loudspeaker. One set is required for each Q1 cabinet within a vertical array. The rigging set includes the following components:

- 2 x Z5151 Q Splay link **[a]**
- 2 x Z5152 Q Front link **[b]**
- 8 x Z5153 Locking pins 8 mm (linked in pairs with a steel wire) **[c]**

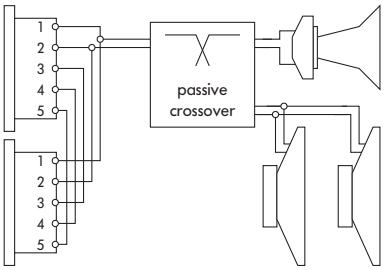


**Fig. 3: Connector wiring**

## Connections

The Q1 cabinet is fitted with a pair of EP5 connectors. All five pins of both connectors are wired in parallel. The Q1 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 Q1 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. |

## Operation with D6 or D12

**NOTICE:** Only operate Q1 loudspeakers with a correctly configured d&b amplifier, otherwise there is a risk of damaging the loudspeaker components.

The D6 and D12 amplifiers provide two setups (Q1 or Q1 line) for Q1 cabinets (D12 from firmware V2.10). The selection depends on the curvature of the array. Straight array sections (small splay angles) extend the acoustical near field of the sources to a considerable extent. These cabinets need a different tonal balance than cabinets used in curved array sections. For this reason, both amplifier configurations are used within typical Q1 arrays.

Within the D12 amplifier the setups are available in "Dual Channel" and "Mix TOP/SUB" mode.

Up to a total of two Q1 loudspeakers can be driven by each D6 or D12 amplifier channel.

In applications with low continuous levels and low ambient temperatures up to three cabinets can be connected to a D12 channel.

Select the respective controller setup Q1 or Q1 Line.

### "Q1" setup

The Q1 setup (standard configuration) is used for Q1 loudspeakers in small arrays of up to 4 cabinets and in curved sections of larger arrays. With more than two consecutive splay settings of 0°, 1° or 2° the "Line" configuration should be used for the respective cabinets.

### "Q1 Line" setup

The "Line" configuration is used for groups of four or more Q1 loudspeakers which are coupled to form a straight long throw array section where the splay angles to adjacent cabinets are 0°, 1° or 2°. Compared to the standard configuration the mid/-high range is reduced to compensate for the extended near field.

The transition from "Q1 Line" to "Q1" configuration within the array is made according to the splay progression but may allow for certain deviations due to the paired wiring of the cabinets.

### Controller settings

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

**CUT circuit**
Set to CUT, the Q1 low frequency level is reduced. The Q1 is now configured for use with the Q-SUB or d&b C-Series 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 should be used selectively, only for those cabinets covering distances larger than 30 m (100 ft). This guarantees the correct sound balance between close and remote audience areas, whilst all amplifiers driving the array can be fed with the same signal.

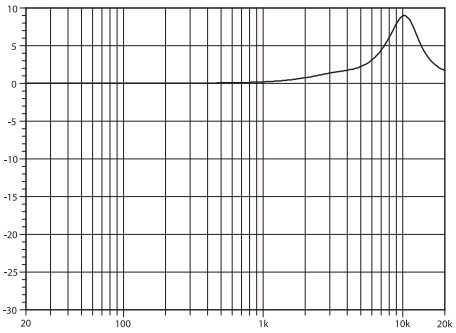


**Fig. 4: Frequency response correction of HFC circuit**

**CPL circuit**
The CPL (Coupling) circuit compensates for coupling effects between the cabinets; these effects increase as the length of the line array is extended. CPL begins gradually at 1 kHz, with the maximum attenuation below 400 Hz, providing a balanced frequency response when Q1 cabinets are used in arrays of four or more. The function of the CPL circuit 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).

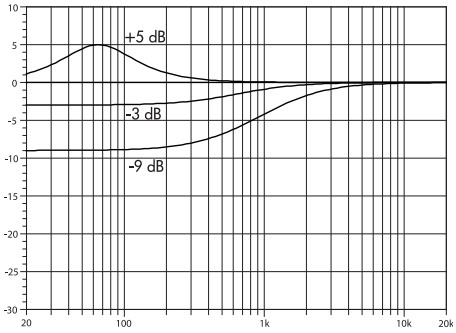


**Fig. 5: Frequency response correction of CPL circuit**

## Operation with E-PAC

Selecting Q1 mode enables the E-PAC to drive one Q1 loudspeaker. LO IMP mode allows the E-PAC to drive two Q1 loudspeakers with a 6 dB reduction of input level to the speakers.

The CUT and CPL settings are available. The characteristics of the CUT and CPL settings are explained in the previous section "Operation with D6 or D12 - Controller settings".

The E-PAC CPL circuit creates a 3 dB attenuation corresponding with the – 3 dB curve shown in Fig. 5.

## Dispersion characteristics

The graphs below show dispersion angle over frequency of a single Q1 cabinet plotted using lines of equal sound pressure (isobars) at −6 dB and −12 dB. The nominal horizontal dispersion of 75° is maintained above 400 Hz.

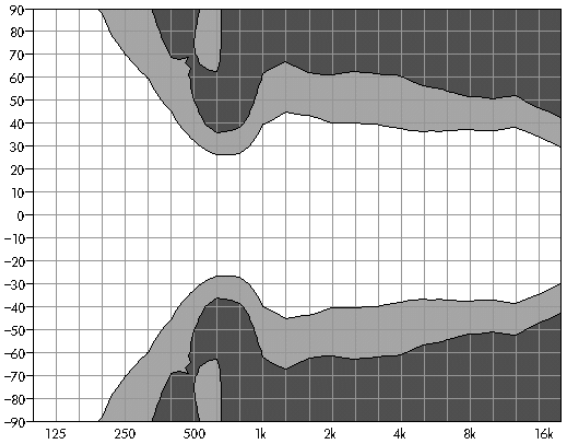


**Fig. 6: Isobar diagram Q1 horizontal**

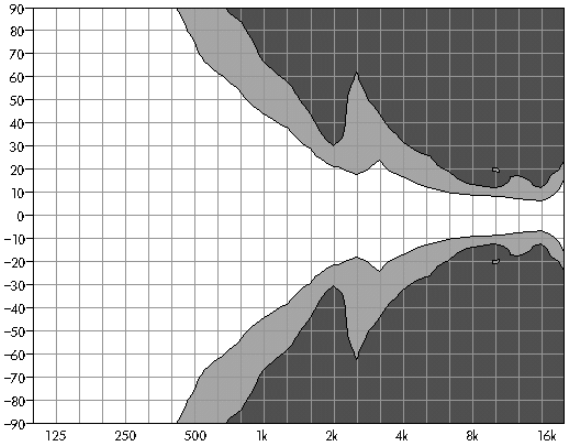


**Fig. 7: Isobar diagram Q1 vertical**

## Technical specifications

### Q1 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.....139 dB
Max. sound pressure (single cabinet, 1 m, free field) with D6.....135 dB
(SPLmax peak, pink noise test signal with crest factor of 4)
Input level (100 dB-SPL/1 m).....−18 dBu

### Q1 loudspeaker

Nominal impedance.....8 ohms
Power handling capacity (RMS / peak 10 ms).....400/1600 W
Nominal dispersion angle (hor. x vert.).....75° x 15°
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)

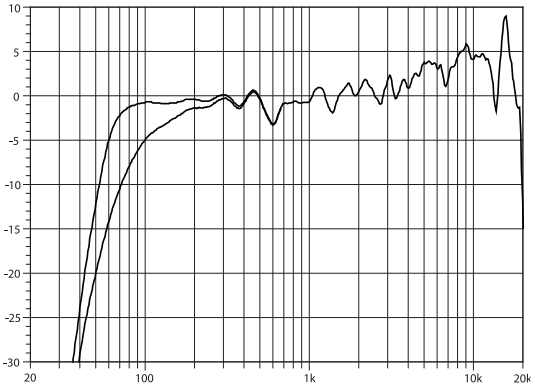


**Fig. 8: Q1 frequency response, standard and CUT settings, single cabinet**

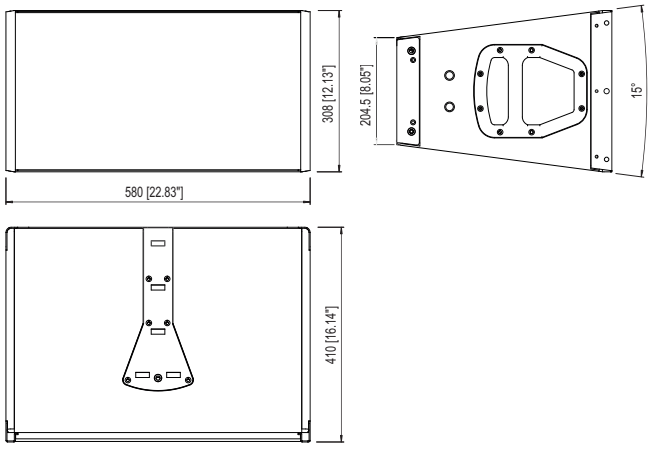


**Fig. 9: Q1 cabinet dimensions in mm [inch]**

# Manufacturer's declarations

## EU conformity of loudspeakers (CE symbol)

This declaration applies to

**- Q1 loudspeaker Z0501**

manufactured by d&b audiotechnik GmbH.

All production versions of this type 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.

## 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.



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