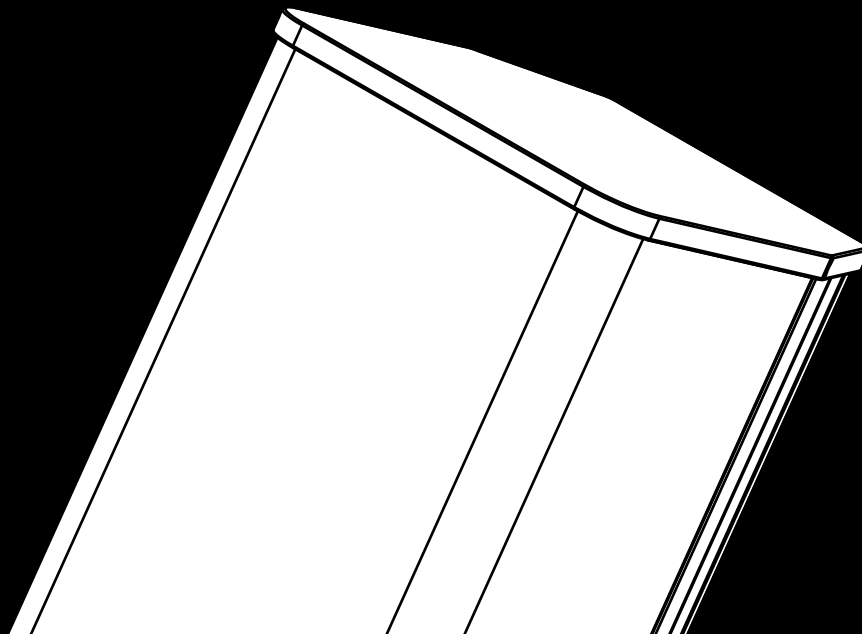
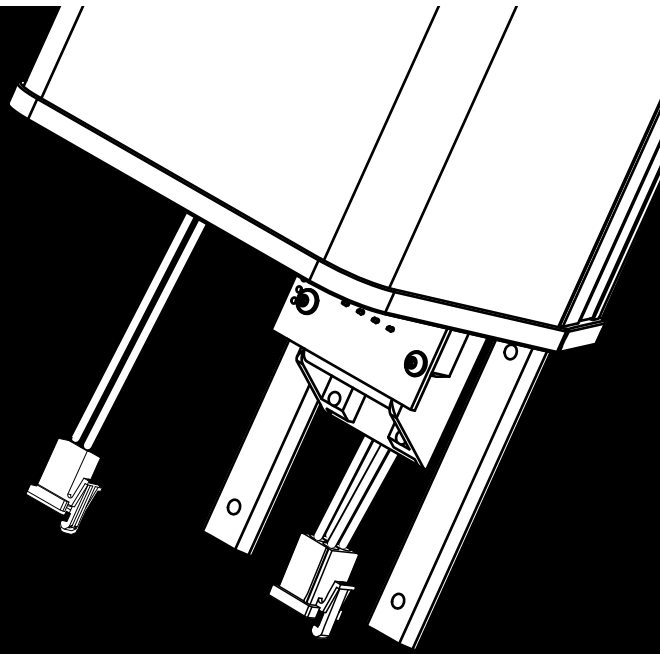


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24C/24C-E Manual 1.4 en



General information

24C/24C-E Manual

Version: 1.4 en, 02/2016, D2618.EN .01

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1.1 Information regarding the use of loudspeakers

Potential risk of personal injury

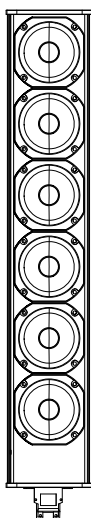
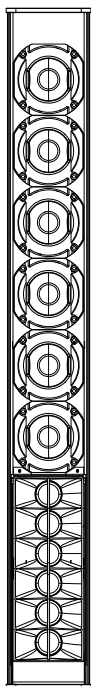
Never stand in the immediate vicinity of loudspeakers driven at a high level. Professional loudspeaker systems are capable of causing a sound pressure level detrimental to human health. Seemingly non-critical sound levels (from approx. 95 dB SPL) can cause hearing damage if people are exposed to it over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



2.1 Product description

2.1.1 24C cardioid column loudspeaker

The 24C is a passive 2-way column loudspeaker housing six 4" neodymium drivers and an HF array comprising six 1.1" dome tweeters.

The 4" drivers are arranged in a unique cardioid setup radiating through waveguide elements at the front and damped ports at the rear of the cabinet. This design provides a constant directivity pattern of 90° in the horizontal plane with an average broadband attenuation to the rear of approx. 18 dB.

In the vertical plane, the beam produced by the low-mid drivers is tilted downwards by -5° and provides significant directivity down to 370 Hz.

The HF array has a nominal vertical dispersion of 20° and its main axis can be adjusted continuously between 0° and -14° (when using ArrayCalc, adjustment in 1° increments).

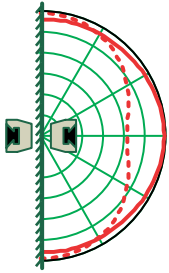
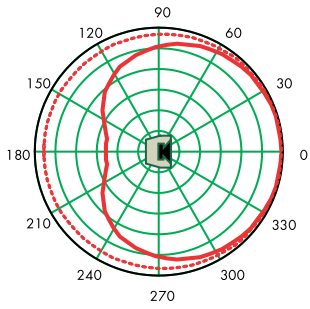
The loudspeaker cabinets are based on an extruded aluminum profile with a metal grill protecting the front of the loudspeaker. Two continuous rails (8 mm T-slot profiles) are provided at the rear for attaching a wall mount bracket.

2.1.2 24C-E cardioid column extender

The 24C-E is a passive column extension to be attached directly to the 24C. The cabinet houses six 4" neodymium drivers, providing an extension of vertical directivity down by a further octave to 190 Hz.

The acoustic design is based on the same principles as the 24C, thus offering the same cardioid dispersion pattern in the horizontal plane. The extender is electrically connected through the 24C without the need for an additional amplifier channel.

Note: The 24C-E loudspeaker is not intended to be operated as a stand-alone system.



2.1.3 Cardioid dispersion

Due to their dimensions, conventional column loudspeakers provide no significant horizontal directivity below 2 kHz.

At low and mid frequencies, the resulting polar pattern is almost omnidirectional (dotted line).

The cardioid patterns of the 24C and 24C-E show a much higher directivity resulting in much less energy radiated into the room (continuous line).

Typically, column loudspeakers are mounted onto walls or other hard plane surfaces. Hard surfaces act as an acoustic mirror. That means, the room is not only covered by the sound of the actual column loudspeaker but also by the sound produced by its virtual mirror source from "behind".

In the case of conventional column loudspeakers with their low horizontal directivity, the mirror source radiates at a similar level as the loudspeaker itself.

The combination of both sources results in a dipolar characteristic where the main energy is radiated along the walls (dotted line). The 24C and 24C-E, however, with their cardioid dispersion patterns provide an even dispersion characteristic and a useful directivity when mounted onto a wall.

2.1.3.1 Flush mounting

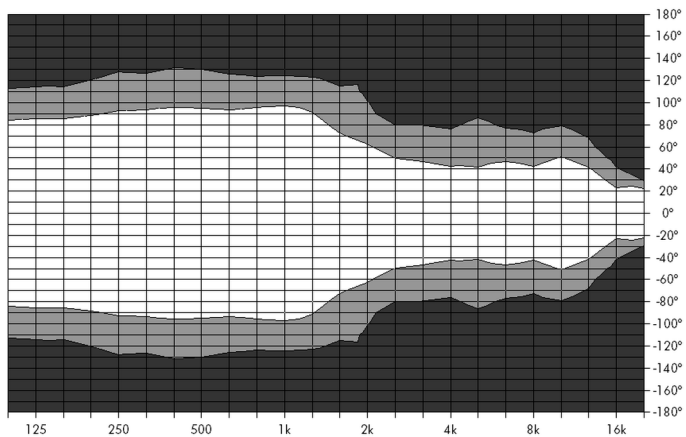
If architecturally required, xC-Series cabinets may be partially flush mounted.

Please note that this will render the cardioid ports ineffective and as a result, may change the dispersion pattern.

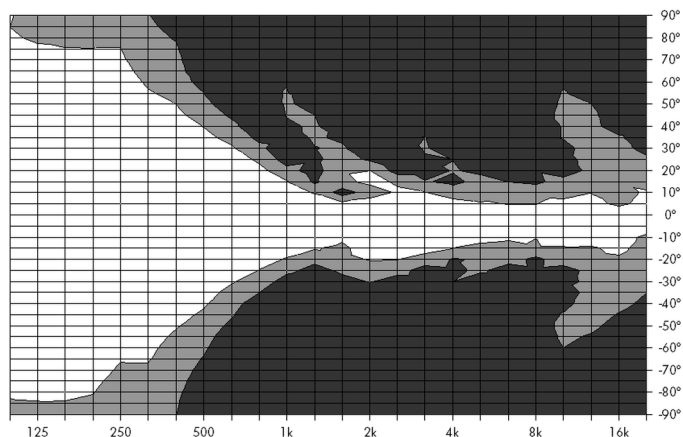
In conjunction with 24C cabinets, care must also be taken to ensure that the dispersion of the rearmost horn of the HF array is not obstructed by the edges of the wall recess. Otherwise, this will create reflections which will have a negative impact on the frequency response in front of the cabinet. The same applies when the cabinet is mounted in a corner of the room. Reflections of the adjacent side walls will cause deviations in both, the frontal frequency response and the dispersion pattern.

2.1.4 Dispersion characteristics

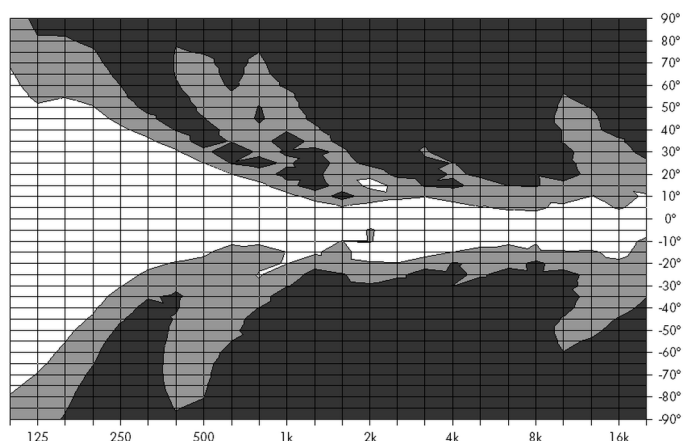
The following graphs show dispersion angle over frequency of a single cabinet plotted using lines of equal sound pressure (isobars) at -6 dB and -12 dB.



Isobar diagram 24C horizontal

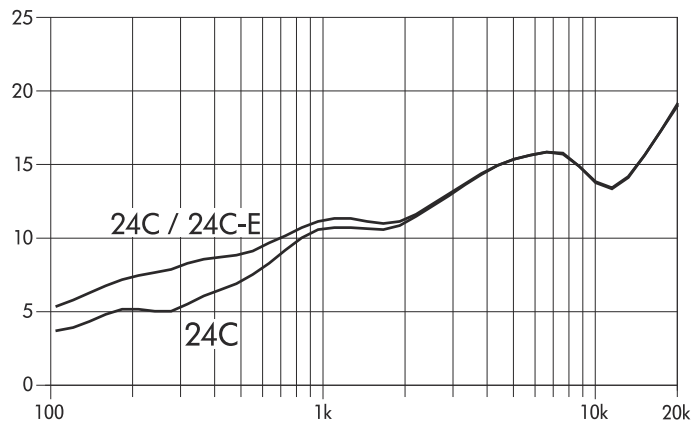


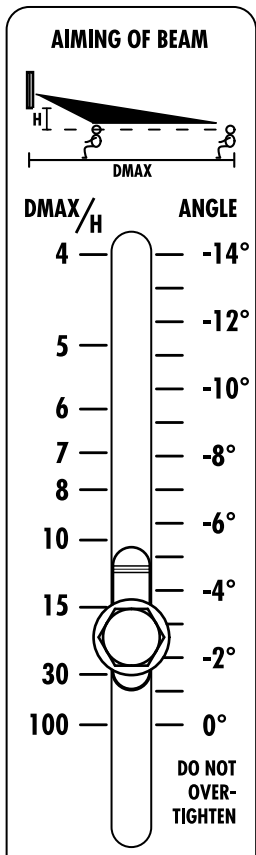
Isobar diagram 24C vertical



Isobar diagram 24C with 24C-E vertical

2.1.5 Directivity index (dB)





HF beam set to $DMAX/H = 12$

2.1.6 Aiming of the beam

The aiming of the beam of the HF array can be adjusted between 0° and -14° .

The DMAX/H scale on the left provides a simple means of determining the correct setting for a given room geometry. The assumption here is the listening plane is horizontal and the loudspeaker column is mounted exactly vertically.

Simply take the maximum distance to be covered (DMAX) and divide it by the height (H) above the listeners' ears up to the bottom edge of the cabinet. Set the mark to the respective DMAX/H value.

Example:

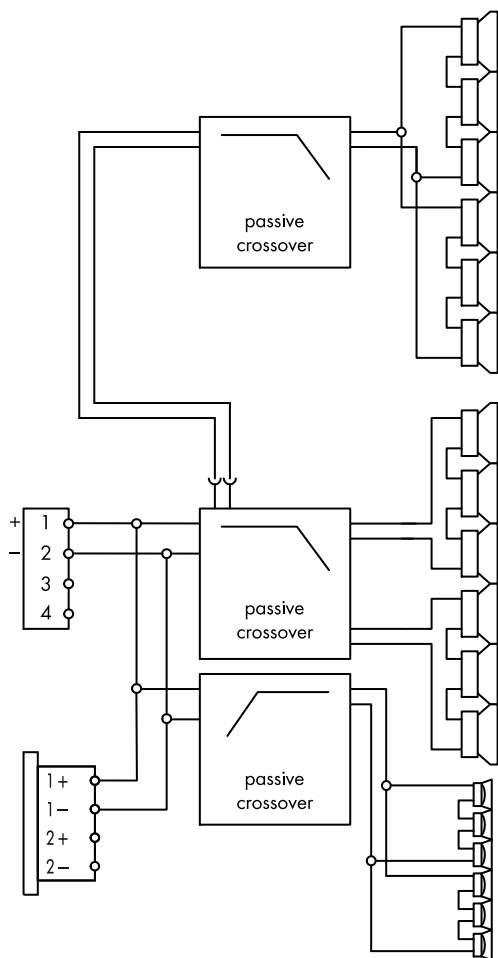
A seated audience has a typical ear height of 1.20 m (4 ft) above ground level. The bottom edge of the loudspeaker is at 2.70 m (9 ft) above ground level, i.e. 1.50 m (5 ft) above ear level. The maximum distance to be covered is 18 m (60 ft).

The HF beam has therefore to be set to:
 $18 \text{ m} / 1.50 \text{ m} = 12$ ($60 \text{ ft} / 5 \text{ ft} = 12$)

To aim the beam, proceed as follows:

Tools required: 10 mm (1/4") wrench/spanner

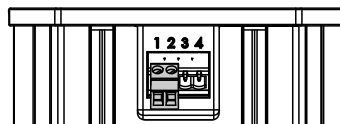
1. At the rear, slacken the M6 hex head screw.
2. Slide the screw up or down to set the mark above the screw to the calculated value.
3. Carefully retighten the screw.



Connector wiring

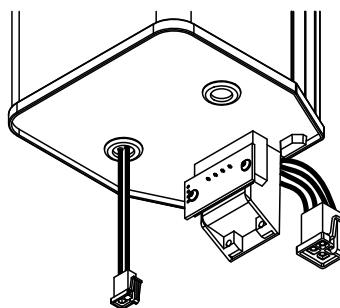
2.2 Connections

24C cabinets are fitted with a 4-pole Phoenix Euroblock connector block accepting a 2-pole Phoenix Euroblock screw terminal connector (cross-section up to 4 mm²/AWG 11). The connector uses the pin assignments 1: + and 2: -. Pins 3 and 4 are not connected.



In addition, an NL4 M connector is provided using the pin assignment 1+/1-.

24C-E cabinets are equipped with a fixed cable gland fitted with a 2-pole Mate-N-Lok mini connector. The extender is electrically connected through the 24C cabinet.



In addition, 24C-E cabinets are also equipped with the same 4-pole Phoenix Euroblock connector block and the corresponding input connector cable as the 24C cabinets to allow quick and easy attachment of the extender to the 24C cabinet.

A detailed description of how to attach and connect the extender is given in ⇒ Chapter 3 "Attaching the 24C-E extender" on page 13.

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.

Applicable d&b amplifiers:

10D/30D/D6/D12/D20/D80.

Application	Setup	Cabinets per channel
24C	24C	2
24C with 24C-E	24C-E	1

For applicable amplifiers, the controller setups are available in Dual Channel and Mix TOP/SUB mode.

2.3.1 Controller settings

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

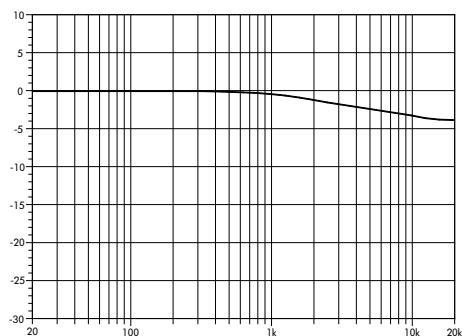
CUT circuit

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

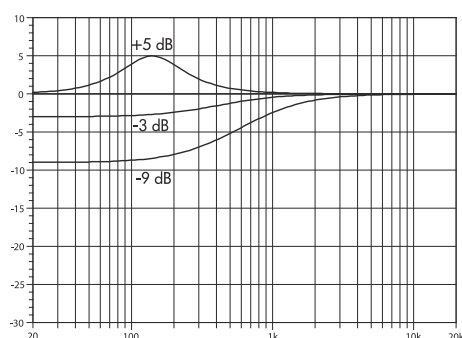
HFA circuit

In HFA mode (High Frequency Attenuation), the HF response of the system is rolled off. 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.



Frequency response correction of HFA circuit

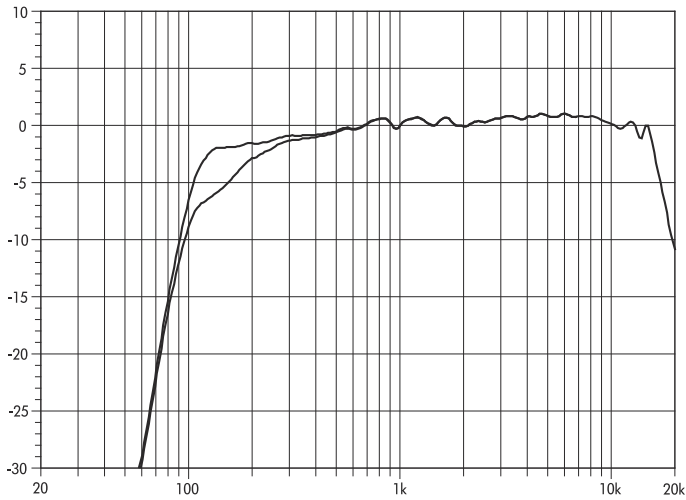


Frequency response correction of CPL circuit

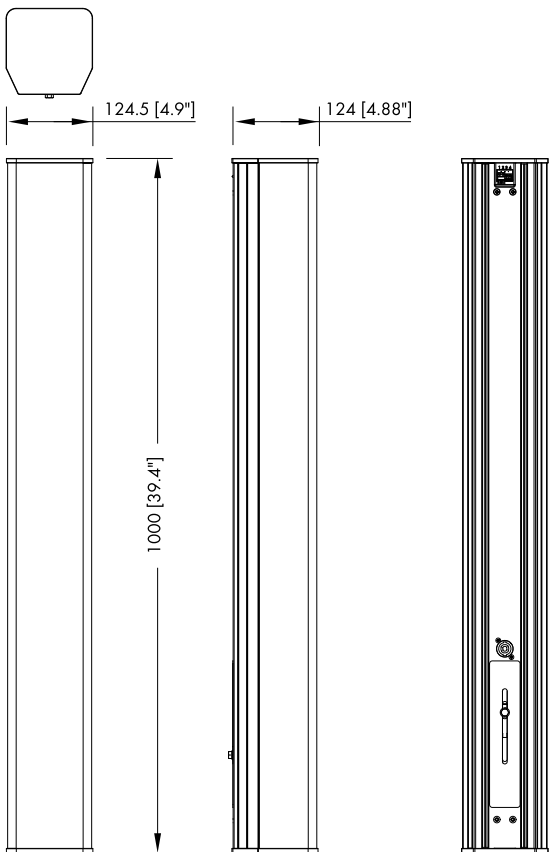
CPL circuit

The CPL (Coupling) circuit compensates for different acoustic properties of the venue. CPL begins gradually around 1 kHz, with the maximum attenuation below 250 Hz. To achieve a balanced frequency response, the CPL circuit can be set to dB attenuation values between 0 and -9.

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.



24C frequency response, standard and CUT modes



24C cabinet dimensions in mm [inch]

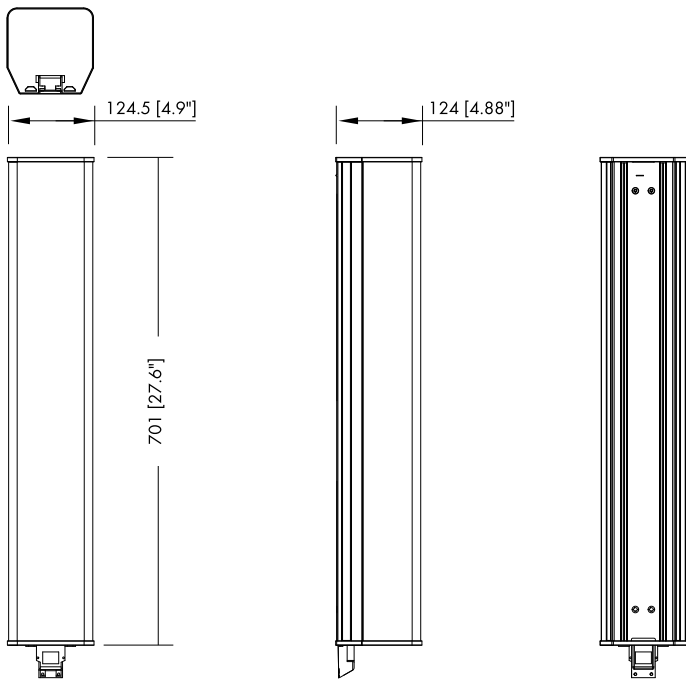
2.4 Technical specifications

24C system data

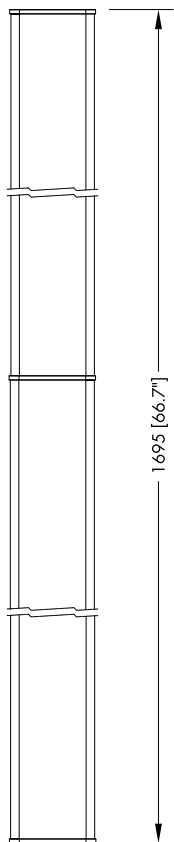
Frequency response (-5 dB standard)	110 Hz - 17 kHz
Frequency response (-5 dB CUT mode)	150 Hz - 17 kHz
Max. sound pressure (1 m, free field)	
24C with 10D/30D/D6/D12/D20/D80	126 dB
..... (SPLmax peak, pink noise test signal with crest factor of 4)	

24C loudspeaker

Nominal impedance	12 ohms
Power handling capacity (RMS/peak 10 ms)	125/600 W
Nominal dispersion angle (h x v)	90° x 20°
Vertical aiming of low-mid beam	-5°
Vertical adjustment of HF array	0° to -14°
Components	6 x 4" driver with neodymium magnet
.....	6 x 1.1" dome tweeter mounted in vertical horn array
.....	Passive crossover network
Connections	4-pin Phoenix Euroblock and 1 x NL4 M
Pin assignment	Phoenix: 1: + / 2: - (3/4: n.c.)
.....	NL4 M: 1+/1-
Enclosure	Extruded aluminum, metal baffle and front grill
Weight	9 kg (19.8 lb)
Mounting	Dual-rail 8 mm T-slot profile at the rear



24C-E cabinet dimensions in mm [inch]



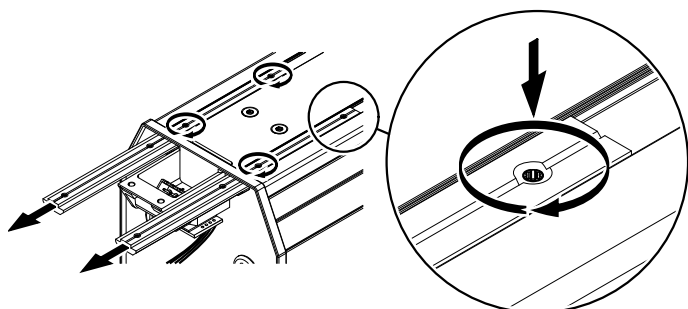
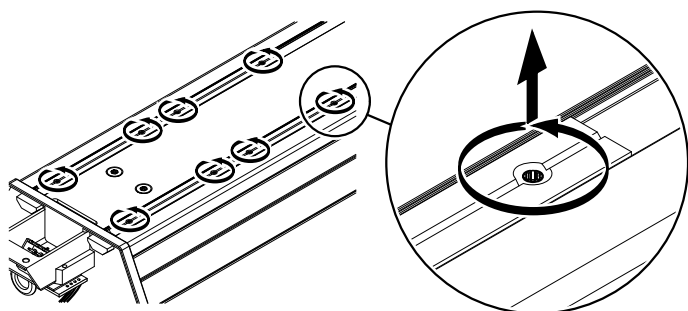
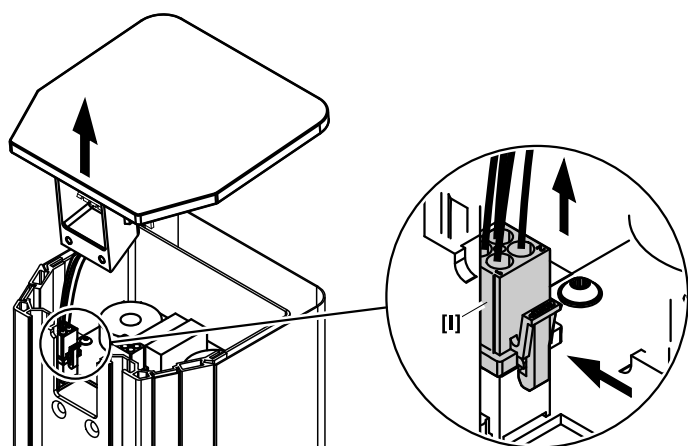
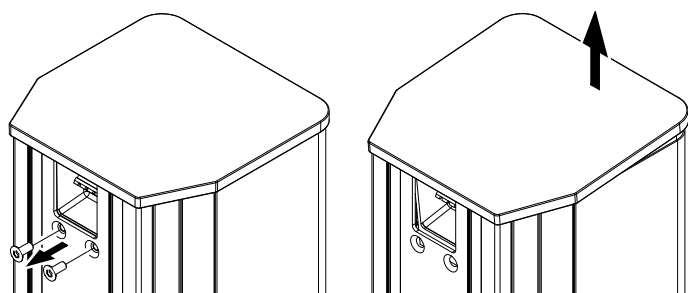
24C-E loudspeaker

Power handling capacity (RMS/peak 10 ms) 125/600 W
 Components 6 x 4" driver with neodymium magnet
 Connections
 Fixed cable gland with 2-pole Mate-N-Lok mini through 24C
 Enclosure Extruded aluminum, metal baffle and front grill
 Weight 7 kg (15.4 lb)
 Mounting Dual-rail 8 mm T-slot profile at the rear

24C loudspeaker with 24C-E extender

Max. sound pressure (1 m, free field) 128 dB
 Nominal impedance 6 ohms
 Power handling capacity (RMS/peak 10 ms) 250/1200 W
 Dispersion angle (h x v) 90° x 20°
 Components 12 x 4" driver with neodymium magnet
 6 x 1.1" dome tweeter mounted in vertical horn array
 Weight 16 kg (35 lb)
 Total height 1695 mm (66.7 inch)

3 Attaching the 24C-E extender



Tools required

- Torx wrench / screwdriver size #TX20
- Torx wrench / screwdriver size #TX15

Remarks

The assembly may be carried out by a single person. However, we recommend a second person for assistance. Proceed as follows:

1. Preparing the 24C cabinet

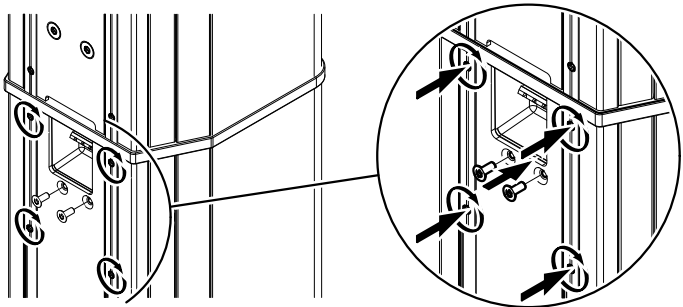
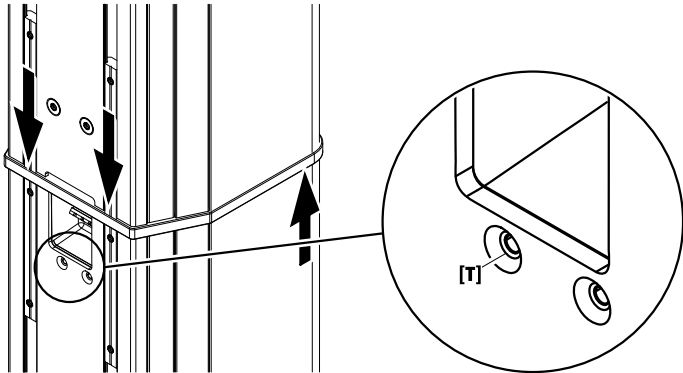
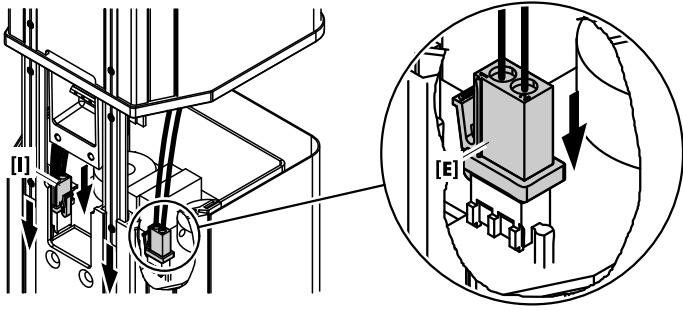
1. At the rear of the cabinet, undo the two countersunk screws (torx #T20) for the top panel.
2. Slightly lift the front part of the top panel.

3. Lift the back part of the top panel out of its guiding slot.
4. Disconnect the input connector [1] and take off the top panel.

2. Preparing the 24C-E cabinet

1. At the rear of the 24C-E cabinet, slacken the eight fixing screws (set screws - #T15) of the connecting rails.

2. Pull out the two connecting rails half their lengths.
3. Retighten the four remaining fixing screws on the extender.



3. Joining the cabinets

1. While a second person renders assistance, insert the connecting rails of the 24C-E cabinet into the T-slot profiles at the rear of the 24C cabinet approx. 10 - 20 mm.
2. Reconnect the input connector [I].
3. Push the Mate-N-Lok plug [E] of the extender into the respective connecting socket, as shown in the graphic opposite.
4. Fully insert the connecting rails into the T-slot profiles.
 - ↳ Ensure that no connecting wire is crushed between the edges of the cabinets.

Ensure that the connecting panel of the extender is fully inserted.
The connecting panel is fully inserted when the front grill of the 24C cabinet is properly fitted into the panel and the threaded inserts [T] are in line with the countersunk drills of the 24C cabinet.
5. Refit and tighten the two countersunk screws (torx #T20).
6. Tighten the remaining four fixing screws (set screw - torx #T15) of the connecting rails on the 24C cabinet.



4.1 EU conformity of loudspeakers (CE symbol)

This declaration applies to:

d&b 24C loudspeaker, Z1700

d&b 24C-E loudspeaker, Z1710

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.

4.2 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.

