



Figure 1a

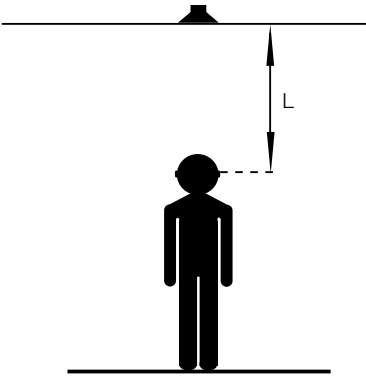


Figure 1b

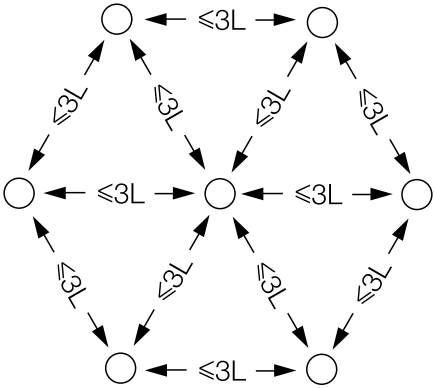


Figure 2

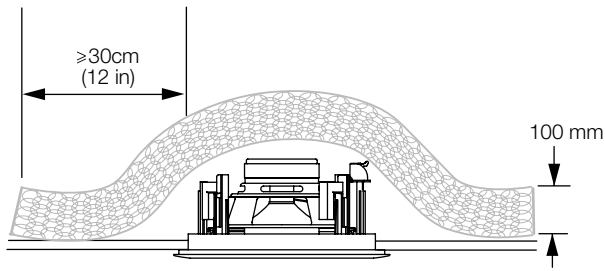


Figure 3

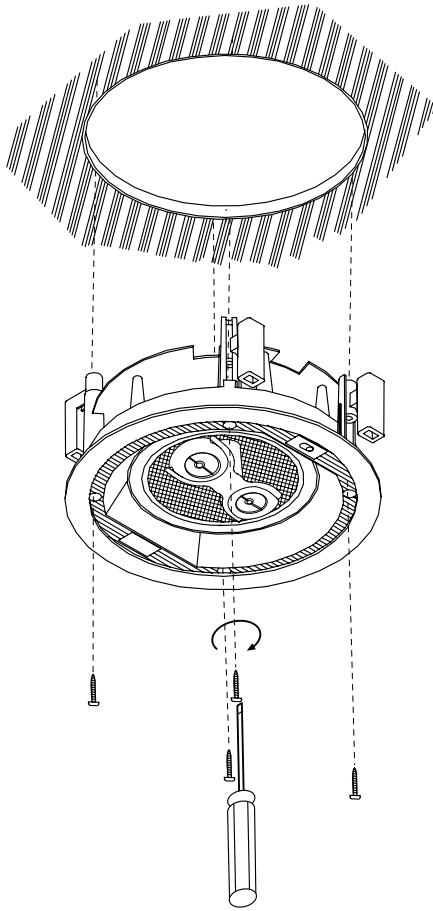


Figure 4

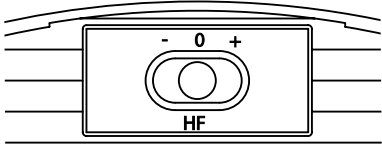
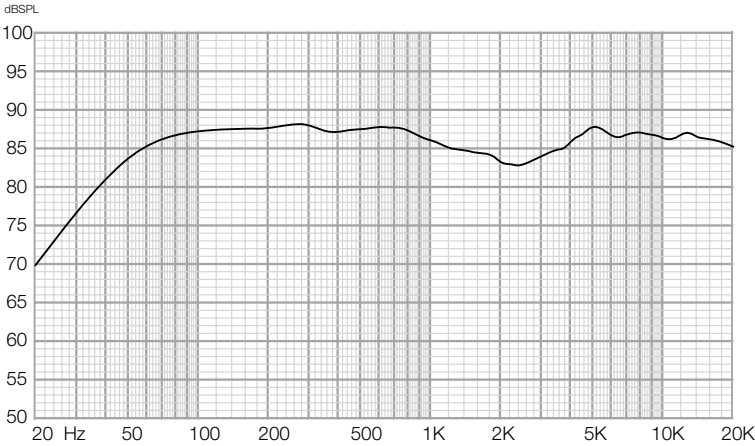


Figure 5

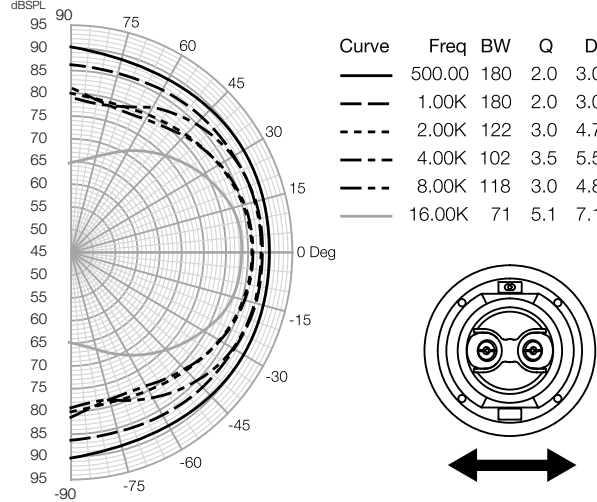
AWG	0.2 Ω	0.3 Ω	0.4 Ω	0.5 Ω	Loop Resistance
20	10	15	20	25	Feet
18	16	23	31	39	
16	25	37	49	62	
14	39	59	78	98	
12	62	93	124	155	
10	98	147	196	245	
9	123	185	247	309	

mm ²	0.2 Ω	0.3 Ω	0.4 Ω	0.5 Ω	Loop Resistance
0.5	2.9	4.4	5.9	7.4	Metres
0.75	4.4	6.6	8.8	11.0	
1	5.9	8.8	11.8	14.7	
1.5	8.8	13.2	17.6	22.1	
2.5	14.7	22.1	29.4	36.8	
4	23.5	35.3	47.1	58.8	
6	35.3	52.9	70.6	88.2	

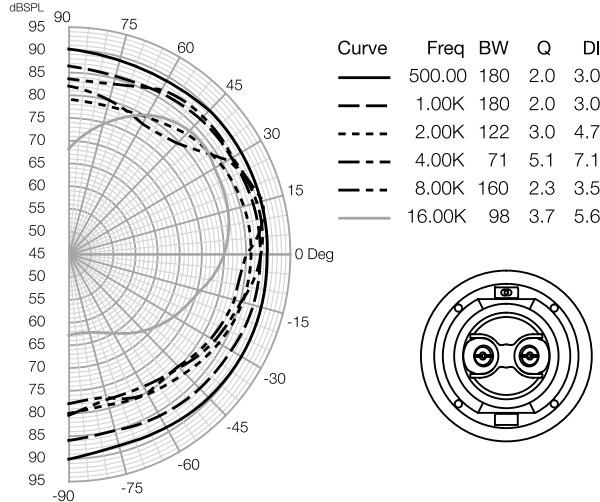
Frequency response



Polar Response Horizontal



Polar Response Vertical



English

Limited Warranty

Dear customer, welcome to B&W.

This product has been designed and manufactured to the highest quality standards. However, if something does go wrong with this product, B&W Loudspeakers and its national distributors warrant free of charge labour (exclusion may apply) and replacement parts in any country served by an official B&W distributor.

This limited warranty is valid for a period of five years from the date of purchase or two years for electronics including amplified loudspeakers.

Terms and Conditions

- 1 The warranty is limited to the repair of the equipment. Neither transportation, nor any other costs, nor any risk for removal, transportation and installation of products is covered by this warranty.
- 2 This warranty is only valid for the original owner. It is not transferable.
- 3 This warranty will not be applicable in cases other than defects in materials and/or workmanship at the time of purchase and will not be applicable:
 - a. for damages caused by incorrect installation, connection or packing,
 - b. for damages caused by any use other than correct use described in the user manual, negligence, modifications, or use of parts that are not made or authorised by B&W,
 - c. for damages caused by faulty or unsuitable ancillary equipment,
 - d. for damages caused by accidents, lightning, water, fire heat, war, public disturbances or any other cause beyond the reasonable control of B&W and its appointed distributors,
 - e. for products whose serial number has been altered, deleted, removed or made illegible,
 - f. if repairs or modifications have been executed by an unauthorised person.
- 4 This guarantee complements any national/regional law obligations of dealers or national distributors and does not affect your statutory rights as a customer.

How to claim repairs under warranty

Should service be required, please follow the following procedure:

- 1 If the equipment is being used in the country of purchase, you should contact the B&W authorised dealer from whom the equipment was purchased.
- 2 If the equipment is being used outside the country of purchase, you should contact B&W national distributor in the country of residence who will advise

where the equipment can be serviced. You can call B&W in the UK or visit our web site to get the contact details of your local distributor.

To validate your warranty, you will need to produce this warranty booklet completed and stamped by your dealer on the date of purchase. Alternatively, you will need the original sales invoice or other proof of ownership and date of purchase.

Owner's manual

Introduction

Thank you for purchasing Bowers and Wilkins CCM 646S speakers.

Since its foundation in 1966, the continuing philosophy of B&W has been the quest for perfect sound reproduction. Inspired by the company's founder, the late John Bowers, this quest has entailed not only high investment in audio technology and innovation but also an abiding appreciation of music and movies to ensure that the technology is put to maximum effect.

The CCM 646S outputs the signals from two channels from a single unit and is intended for background sound applications where channel separation is not important or desired.

However, no matter how good the speakers themselves, they will not deliver their full potential unless properly installed. Please read through this manual fully. It will help you optimise the performance of the system.

B&W distributes to over 60 countries worldwide and maintains a network of dedicated distributors who will be able to help should you have any problems your dealer cannot resolve.

Check the contents

This pack should contain:

Frame/baffle with drivers and crossover
Grille
Paint mask
Mounting template

Choosing the position

Check that there is no conflict with other installations (pipe work, air conditioning, power cabling etc.). In existing drywall construction, use a stud-finding tool to map the construction accurately and a pipe detector to scan the proposed installation position.

Ensure that there is enough clearance behind the plasterboard (sheetrock) for the clamps to swing out fully.

Avoid installing the speakers in the same cavity as flimsy ducting, which may be induced to rattle.

The speakers are designed to operate satisfactorily in a wide range of cavity volumes, ideally above 10 litres (0.4 cu ft), so make sure the volume is not too restricted by cross studs.

The speakers are balanced for half-space mounting (ie flush in a ceiling or soffit). Placement near a wall/ceiling junction or in a corner may give rise to too much bass and a boomy quality to the sound. Try to keep the speakers at least 0.5m (20in) from wall/ceiling edges.

The following sections give guidance on optimum positioning, but this may be modified in line with domestic constraints.

WARNING: The speakers produce a static magnetic field. As such They should not be placed within 0.5m (20in) of equipment that may be affected by such a field (eg Cathode Ray Tubes in TVs and Personal Computers).

Distributed audio

To maintain clarity and speech intelligibility, it's important that listeners are never too far off axis of the nearest speaker. The speaker spacing will depend on the height of the ceiling and the level of sound required. More speakers played at a lower level will give better clarity. We recommend that the distance between adjacent speakers is no more than 3 times the distance between average ear height and the ceiling. For any given spacing, there will be fewer weak spots with a triangular grid than a rectangular one. (figure 1)

PREPARING THE LOCATION

Choosing cable

Excessive resistance in the speaker cable wastes power and alters the frequency response of the speaker. Always try to keep the resistance as low as possible with the loop resistance preferably below 0.5 ohms. Use the table of figure 5 to calculate the minimum gauge of cable required.

Existing drywall construction (retrofit)

Mark the centre position of the speaker and position the template so the mark shows through the hole in the middle.

Trace round the outer edge of the template and cut neatly just inside the line.

To improve the mechanical integrity of the ceiling and reduce the likelihood of rattles, we recommend you apply a bead of wood glue or mastic along the joints between the back of the plasterboard and the studs in the vicinity of the speaker.

Run the cable to the aperture, allowing enough length to comfortably connect the speaker, but not too much, as the excess may rattle against the structure.

New drywall construction

The speaker can be installed once the ceiling is completed in the same manner as retrofitting, but it is easier to position and cut the hole if the optional pre-mount kit (PMKc65) is used before the plasterboard (sheetrock) is fitted.

Staple or nail the PMK to the studs as described in the instructions with the kit. Run the cable and secure it to the PMK. Allow enough length to comfortably

connect the speaker, but not too much, as the excess may rattle against the structure.

Results are affected by how well the plasterboard is attached to the studs and we recommend gluing as well as screwing or nailing the panels to the studs in the vicinity of the speaker.

Once the board is fitted, the inner flange of the PMK serves as a guide for a hole router or saw.

Damping the cavity

In the ceiling, drape unlined fibreglass or mineral wool matting at the back of the ceiling board, covering the aperture and extending at least 30cm (1 ft) around the speaker into open void. (figure 2)

IMPORTANT: Ensure that the materials you use meet local fire and safety regulations.

Fitting the speaker

All connections should be made with the equipment switched off.

Connect the cables, observing the correct polarity.

With the grille removed, position the speaker in the aperture and screw in the 4 screws visible from the front. (figure 3) These screws automatically swing out clamping dogs that locate behind the mounting surface. Ensure that they have located properly before fully tightening the screws. A certain amount of flexing of the frame is allowed to take up unevenness in the mounting surface, but do not overtighten the screws as excessive distortion of the speaker frame may result.

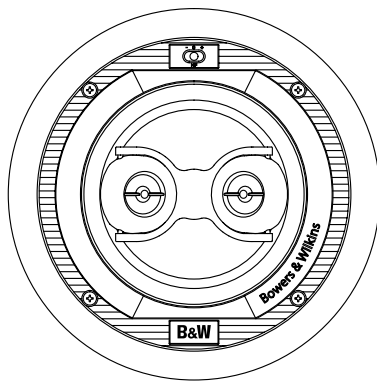
Adjusting the speaker

The switch on the front baffle provides boost or cut to the speaker's high-frequency output level to compensate for listeners positioned severely off axis or a dull acoustic (boost) or highly reflective rooms (cut). (figure 4)

Customising

The frame has a paintable white semi-matte finish, ready if necessary to be re-finished to match your own decor. Fit the paint mask before re-finishing. Do not re-finish the drive units or baffle area behind the grille. Avoid touching the drive units, as damage may result.

Before painting the grille, peel off the fabric scrim from the back, otherwise the pores will get clogged and the sound will be impaired. If the scrim does not stay in place properly when replaced, spray the back of the grille mesh (NOT the scrim) with a light coating of 3M SprayMount adhesive or similar.



CCM646S

Description	2-way dual channel in-ceiling speaker system
Drive units	2x 25mm (1in) high-frequency 1x 165mm (6.5 in) woven fibreglass mid/bass
Frequency range	-6dB at 40Hz and 22kHz
Frequency response	50Hz - 20kHz \pm 3dB
Sensitivity	86dB spl (2.83V, 1m)
Nominal impedance	8 Ω (minimum 3.1 Ω)
Crossover frequency	3.2kHz
Recommended amplifier power	20W-130W continuous into 8 Ω on unclipped programme
Frame size	Diameter: 232mm (9.1in)
Cut-out size	Diameter: 205mm (8.1in)
Min depth req	103mm (4.1in) from ceiling surface
Net weight	1.6kg (3.5lb)
PMK	PMKc65

