

Ceiling Loudspeakers

There are hundreds of different types and models of flush mounting ceiling loudspeaker available to commercial audio installers these days, and sometimes choosing a model for a project can seem a little bewildering, so in this article we discuss the features of a few of the popular models that we sell.

When choosing a ceiling loudspeaker there are several points to consider, some of which are more obvious than others.

What level of volume (SPL) are we hoping to achieve?

This is one of the more obvious questions relevant to any type of loudspeaker in a sound system, but it's an important one. The ambient noise level in the room needs to be considered and from that we can decide the sound pressure level required. It will also help determine which loudspeaker transformer tapping to use when using 100v line systems.

What is the height of the ceiling?

It's vital to know the height of the ceiling as this will affect the SPL, dispersion (i.e. coverage) & intelligibility which, in turn, will affect the number of ceiling loudspeakers required.

What sort of musicality does the loudspeaker need to produce, i.e. its frequency response?

In other words, what will the audio system be used for? It might sound obvious, but the performance requirement of the loudspeakers for speech only paging announcements will be rather different to lively music reproduction for dance classes.

How even does the coverage of the system have to be?

This question not only relates to the intelligibility of the system but also how even the sound level is when playing music. Fewer ceiling loudspeakers normally results in a system which has hot and cold spots, i.e. the level is higher and lower in certain areas. Having insufficient coverage can also mean that paging messages are not understood clearly, and in a PA/VA system this could lead to lives at risk.

How much space is available in the void between the ceiling tiles and the concrete roof slab?

Its always good to check to see how much space there is above the ceiling tile as this may limit what type of loudspeaker you can use. You may also need to consider using a ceiling loudspeaker with a sealed back can for fire ingress protection. (Please refer to EN54-24 and BS5839pt8 or give us a ring!)

We've compared the performance and specifications of a few of our most popular ceiling loudspeakers and have put together a summary specification table for each one. By examining the various elements of the specifications, we've also given each loudspeaker a 'star rating', from 1* to 5*, for each key part of the specification data.

TOA PC-648R

The TOA PC-648R is an entry-level 6w 100v ceiling loudspeaker suitable for general paging announcements and light background music. It comes with a simple to use spring mechanism to fit into the ceiling. It features a 5" single cone transducer and an open back.



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 6w 1m)	97dB	**
Dispersion at 1kHz and 4kHz	160°/80°	***
Frequency response +/- 10dB	100 Hz – 18kHz	*
Usable Coverage*	5.7m Ø	***
Price point		£

RCF PL8x

The RCF PL8x is a 20w two-way 100v ceiling loudspeaker suitable for general paging announcements and mid level background music. It comes with a twist to lock mechanism to fit into the ceiling. It features an 8" low/mid driver with a 1" dome tweeter and an open back.



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 20w 1m)	107dB	****
Dispersion at 1kHz/4kHz	150°/70°	**
Frequency response +/- 10dB	60 Hz – 20kHz	****
Usable Coverage*	4.5m Ø	**
Price point		££

TOA F-2352SC

The TOA F-2352SC is a 6w two-way bass reflex 100v ceiling loudspeaker suitable for general paging announcements and background music. It features a protruding high frequency drive unit with integrated waveguide which improves off axis dispersion enabling fewer loudspeakers to be used to obtain effective coverage.



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 6w 1m)	96dB	**
Dispersion at 1kHz and 4kHz	160°/110°	*****
Frequency response +/- 10dB	80 Hz – 20kHz	***
Usable Coverage*	6m Ø	***
Price point		£££

Bosch LC4-UC06E

The Bosch LC4-UC06E is a 6w two-way wide angle 100v ceiling loudspeaker suitable for general paging announcements and background music. Featuring CosCone driver technology, it provides excellent dispersion. Other models are also available in this range with higher outputs (LC4-UC12E 12w and LC4-UC24E 24w), plus back boxes suitable for BS5839pt8 PAVA compliance (LC4-MFD). (Please note that dispersion characteristics will change when using a back box.)



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 6w 1m)	95dB	**
Dispersion at 1kHz and 4kHz	180°/180°	*****
Frequency response +/- 10dB	65 Hz – 20kHz	****
Usable Coverage*	6m	***
Price point		£££

Cloud CS-C8

The Cloud CS-C8 is a 64w two-way bass reflex 100v ceiling loudspeaker suitable for general paging announcements and mid to high level background music. It comes with a twist to lock mechanism to fit into the ceiling. It features an 8" low/mid driver with a 1" dome tweeter and sealed back with magnetic removable grille.



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 64w 1m)	111dB	*****
Dispersion at 1kHz and 4kHz	150°/90°	***
Frequency response +/- 10dB	64 Hz – 20kHz	****
Usable Coverage*	5.5m Ø	***
Price point		££££

Yamaha VXS8

The Yamaha VXS8 is a premium 60w two-way bass reflex 100v ceiling loudspeaker suitable for general paging announcements and mid to high level background music. It comes with a twist to lock mechanism to fit into the ceiling. It features an 8" low/mid driver with a 1" dome tweeter and sealed back with magnetic removable grille.



	Specifications	Rating (up to 5*)
Maximum Output SPL (at 60w 1m)	110dB	*****
Dispersion at 1kHz and 4kHz	150°/100°	****
Frequency response +/- 10dB	55 Hz – 20kHz	****
Usable Coverage*	6m Ø	***
Price point		£££££

In the following table, we have collated all the specifications above so you can compare them side by side. As you can see, there's a lot to consider. We hope this article is helpful, but should you have any queries at all, please do not hesitate to contact us.

Loudspeaker Model:	TOA PC-648R	RCF PL8x	TOA F-2352SC	Bosch LC4-UC06E	Cloud CS-C8	Yamaha VXS8
Max SPL (rated/1m)	97dB **	97dB ****	96dB **	95dB **	111dB *****	110dB *****
Dispersion 1kHz/4kHz	160°/80° ***	160°/80° **	160°/110° *****	180°/180° *****	150°/90° ***	150°/100° ****
Freq. response +/-10dB	100 Hz-18kHz *	100 Hz-18kHz ****	80 Hz-20kHz ***	65 Hz-20kHz ****	64 Hz – 20kHz ****	55 Hz-20kHz ****
Usable Coverage*	5.7m Ø ***	5.7m Ø **	6m Ø ***	6m Ø ***	5.5m Ø ***	6m Ø ***
Price point	£	££	£££	£££	££££	£££££

Notes

Suggested 'Usable Coverage' diameter is for a 2.7m ceiling height, +/- 3dB, at a floor to ear height of 1.7m.

Dispersion figures are based upon a ceiling height of 2.7m and listening height of 1.7m from floor level, -6dB point.

This article is to be used purely as a guide to the types of ceiling loudspeaker available on the market. Specifications and performance figures have been collated and compared from the relevant manufacturer's data, and subjective individual testing has not been carried out. Let the buyer beware that it is not necessarily the case that all manufacturer's data is comparable!