



LC1 Modular Ceiling Loudspeaker Range



- ▶ **Excellent speech and music reproduction**
- ▶ **Easy installation with one grille size and one complete set of accessories**
- ▶ **Suitable for 70 V and 100 V**
- ▶ **Choice of different ceiling mounting methods**
- ▶ **Optional Pilot Tone indication**
- ▶ **Provision for mounting of the optional line / loudspeaker supervision board**
- ▶ **Installation friendly fire-dome with innovative ceramic connector (patent pending)**
- ▶ **UL listed, BS 5839-8 and EN 60849 compliant**

The LC1 Modular Ceiling Loudspeaker range can be used for a wide variety of ceiling environments. They provide excellent speech and music in indoor public address applications. The range offers a choice of four loudspeakers distinguished by input power, opening angle and sound reproduction. It includes two 6 W single cone loudspeakers offering a choice of opening angle and two high performance 12 W and 24 W coaxial loudspeaker drivers. They all have the same grille size and can be used in combination with the same mounting accessories.

The loudspeakers are suitable for use in air-handling spaces when installed with the LC1-MFD enclosure.

The loudspeaker frame includes provision for mounting the optional pilot-tone indication board or WLS board and has standard a light conductor to indicate the pilot-tone status.

Functions

Voice Alarm applications

Voice alarm loudspeakers are specifically designed for use in buildings where system performance for verbal evacuation announcements is governed by regulations. The LC1 Modular Ceiling Loudspeaker range is designed for use in voice alarm systems and is compliant with British standard BS 5839-8.

Protection

The loudspeakers have built-in protection to ensure that fire damage to the loudspeakers does not cause failure of the connected circuit. In this way system integrity is maintained, ensuring loudspeakers in other areas can still be used to inform people of the situation.

The loudspeakers can also be used in combination with a metal fire-dome to increase protection of the cable termination.

Connections

The loudspeakers have a ceramic screw-terminal connection block, thermal fuse and heat-resistant, high-temperature wiring.

Certifications and Approvals

All Bosch loudspeakers are designed to withstand operating at their rated power for 100 hours in accordance with IEC 268-5 Power Handling Capacity (PHC) standards.

Bosch has also developed the Simulated Acoustical Feedback Exposure (SAFE) test to demonstrate that they can withstand two times their rated power for short durations.

This ensures extra reliability under extreme conditions, leading to higher customer satisfaction, longer operating life, and much less chance of failure or performance deterioration. All plastic parts are self extinguishing according to UL 94 V0.

Region	Certification
Europe	CE
USA	UL
Safety	according to EN 60065
EVAC	according to BS 5839-8 part 8
	according to EN 60849
UL listed	1480/2043
Ball-proof	according to DIN VDE 0710 part 13
Note	To be compliant with UL 1480, the loudspeaker must be installed with the LC1-MFD or LC1-CSMB, or the LC1-CMR including LC1-CCB.

Installation/Configuration Notes

Installation

The LC1 Modular Ceiling Loudspeaker range is very installation friendly. The loudspeaker consists of a frame with the loudspeaker driver and metal grille with integrated light conductor, matching transformer and ceramic screw terminal connection block. On the loudspeaker are provisions for mounting the optional pilot-tone indication board and optional line/loudspeaker surveillance board.

Power tapping on the 70 V / 100 V matching transformer allows selection of full-power, half-power, quarter-power and eight-power radiation.

Ordering information

Due to the modular concept of this system, it is important to order not only the ceiling loudspeaker LC1-xMxxE, but also the flush ceiling mounting accessory of your choice, as mentioned here below. The loudspeakers can be flush mounted into the ceiling by means of the “U” shaped Metal Mounting support bracket LC1-MMSB or the ABS Ceiling Mounting ring LC1-CMR with optional Back Box LC1-CBB.

In order to take full advantage of the modular architecture, all parts are separately packaged in the order in which they are required for installation.

LC1-MMSB Mounting Support Bracket

The metal Mounting Support Bracket has two ceiling clamps, which are secured with thumb screws in the ceiling hole. The bracket is also provided with two 4 mm holes for mounting the bracket with two screws into thin (metal) ceilings. Two spring catchers (for accepting the V-shaped loudspeaker springs) are provided. The bracket provides a provision for attaching an optional safety steel cord.



LC1-MMSB Metal Mounting Support Bracket

LC1-CMR Mounting Ring

The LC1-CMR is an alternative for the ceiling mounting support bracket. The ABS Mounting Ring has two screw driving clamps to fix the mounting ring into the ceiling board. Inside the ring, two spring catchers (for accepting the V-shaped loudspeaker springs) are provided.

LC1-CBB Back Box

On top of the mounting ring, provisions are present to “click-on” the optional Back Box. The combination of Mounting Ring and Back Box prevents sound traveling via the ceiling cavity to adjacent areas, and fully protects the loudspeaker from dust, falling objects.

The Back Box has knock-out holes for two grommets (11 mm/0.80 in) and for two cable glands (20.5 mm/0.80 in)



LC1-CMR and LC1-CBB Ceiling Mounting Ring and Back Box assembly

LC1-CSMB Surface Mounting Box

This ABS Surface Mounting Box is available for securing the ceiling loudspeaker to walls or hard ceilings. The Surface Mounting Box has at the side two holes standard covered opposite positioned and four knock-out holes on the rear side. For optional single point suspension of the assembly of Ceiling Loudspeaker and Surface Mounting Box, a separate metal suspension kit, LC1-MSK is available.



LC1-CSMB Surface Mounting Box

LC1-MSK Metal Suspension Kit

This kit contains a tri-angled metal plate to be attached by three screws (supplied) onto the rear of the Surface Mounting Box and includes three suspension chains, converged in an eye-hook.



LC1-MSK Metal Suspension Kit

LC1-MFD Metal Fire Dome

Ease of installation for individual loudspeaker and loudspeaker/fire-dome combinations. The Fire Dome mounting is fixed in the ceiling, prior to the ceiling speaker mounting. The Fire Dome has a dual connection entry, enabling loop-through cabling and provision for attaching an optional safety steel cord.

Connections are made using an innovative ceramic screw terminal connection block on the metal fire dome with loop-through facility.

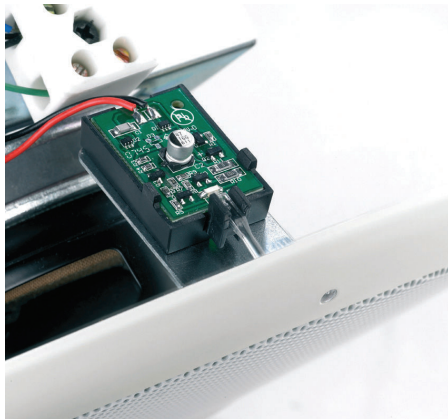
Suitable for use in air-handling spaces.



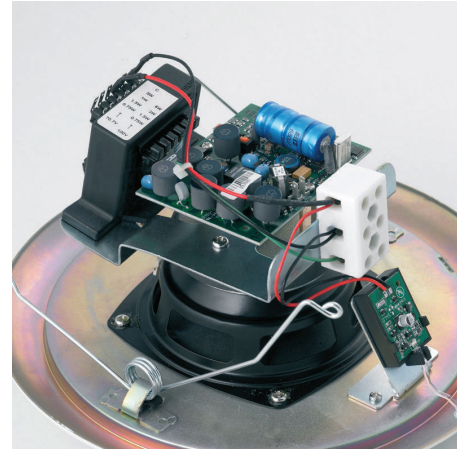
LC1-MFD Metal Fire Dome with innovative ceramic connector (patent pending)

LC1-PIB Pilot-tone Indication Board

The loudspeakers have provision for optional mounting of the Pilot-tone Indication Board. This small PCB with LED can fixed into a holder, connected to a light conductor standard fitted. The presence of the pilot-tone and functioning of the loudspeaker can be visually checked by means of the flashing of the LED, integrated in the front grille rim. The required level of the pilot tone signal is 4 V rms @ 20 kHz and the load to the amplifier from these boards is negligible.



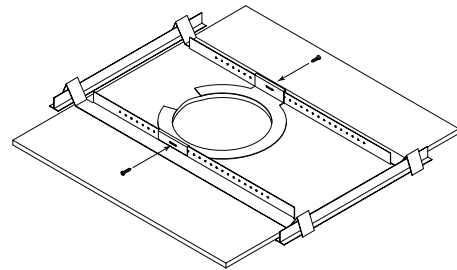
LC1-PIB fitted on the loudspeaker and showing the light conductor



Rear view LC1-WM06E8 showing the optional mounting for LC1-PIB and line/loudspeaker supervision board

LM1-TB Tile bridge / C-ring

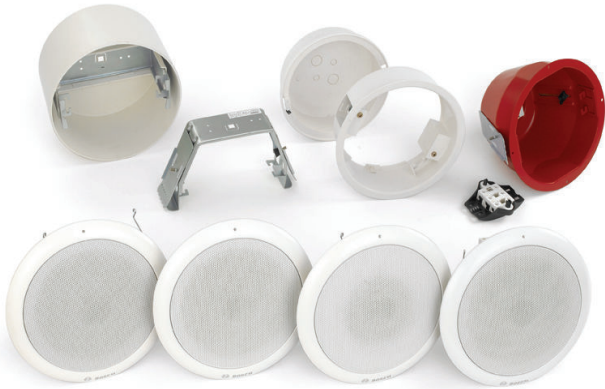
This accessory consists of a C-ring and two tile rails, to be used for reinforce the ceiling material and to spread out the pressure from the ceiling speaker clamps. The C-ring can be guided through the cut-out opening in the ceiling and placed on the back side of the hole before inserting the loudspeaker. The tile rails are suitable for 600 mm distance ceiling tile support rails.



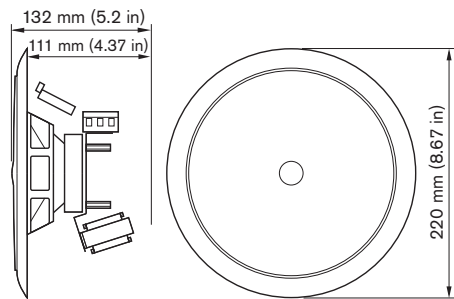
LM1-TB Tile bridge / C-Ring

Type number overview

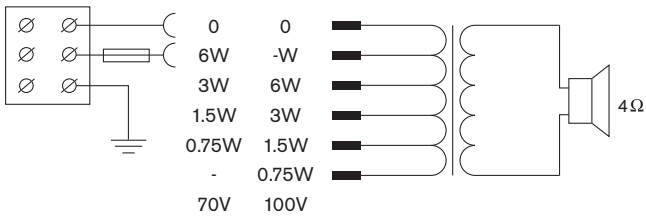
LC1-WM06E8	Ceiling Loudspeaker (6 W)
LC1-UM06E8	Ceiling Loudspeaker (6 W)
LC1-UM12E8	Ceiling Loudspeaker (12 W)
LC1-UM24E8	Ceiling Loudspeaker (24 W)
LC1-MMSB	Mounting support bracket
LC1-CMR	Mounting Ring
LC1-CBB	Back Box
LC1-CSMB	Surface Mounting Box
LC1-MSK	Metal Suspension Kit
LC1-MFD	Metal Fire Dome
LC1-PIB	Pilot-Tone Indication Board
LM1-TB	Tile bridge / C-ring



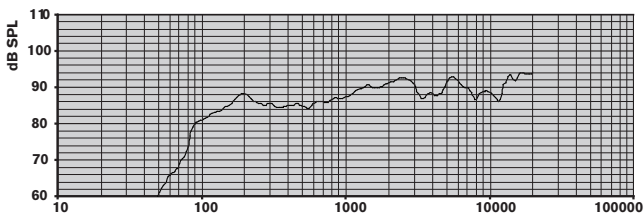
LC1 Modular Ceiling Loudspeaker Range overview



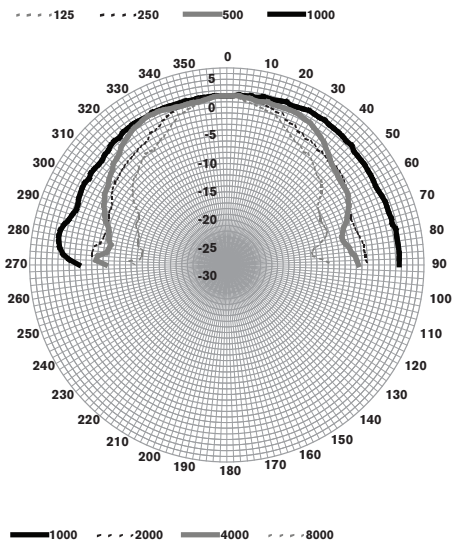
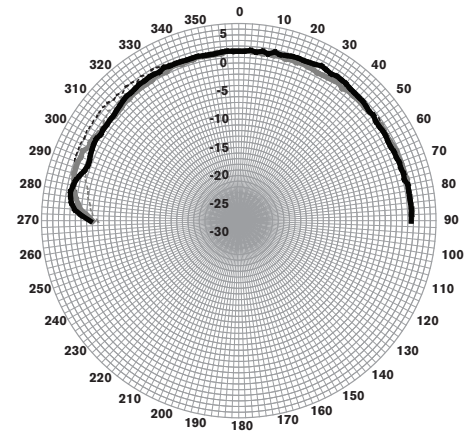
LC1-WM06E8 Dimensions in mm (in)



LC1-WM06E8 Circuit diagram



LC1-WM06E8 Frequency response



LC1-WM06E8 Polar diagrams

Octave band sensitivity LC1-WM06E8

	Octave SPL 1W/1m	Total octave SPL 1W/1m	Total octave SPL Pmax/1m
125 Hz	83.4	-	-
250 Hz	86.1	-	-
500 Hz	85.1	-	-
1000 Hz	87.8	-	-
2000 Hz	91.2	-	-
4000 Hz	89.7	-	-
8000 Hz	89.3	-	-
A-weighted	-	86.9	94.2
Lin-weighted	-	88.1	94.9

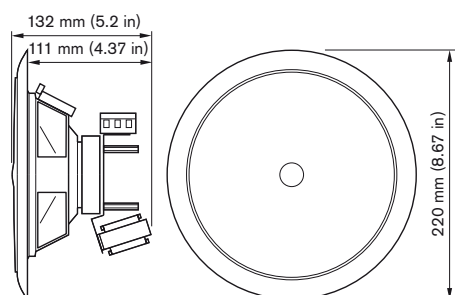
Octave band opening angles LC1-WM06E8

	Horizontal	Vertical
125 Hz	180	180
250 Hz	180	180
500 Hz	180	180

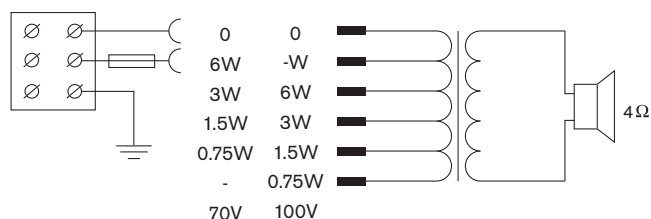
1000 Hz	180	180
2000 Hz	120	120
4000 Hz	128	128
8000 Hz	75	75

LC1-WM06E8 Acoustical performance specified per octave

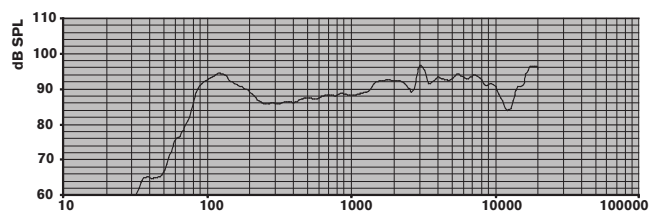
* (all measurements are done with a pink noise signal; the values are in dBSPL).



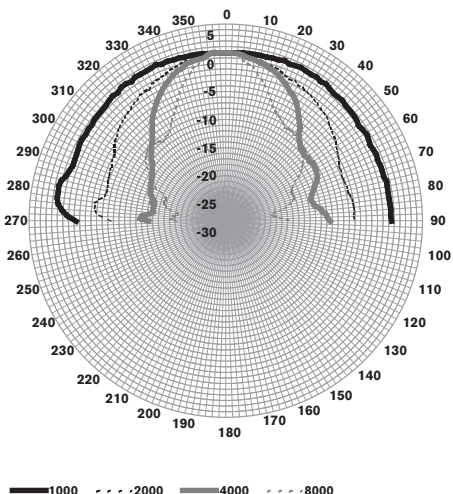
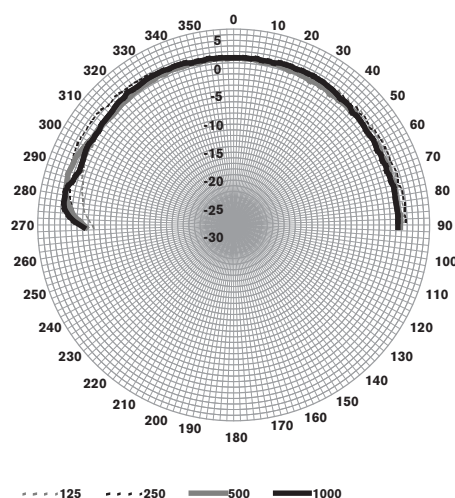
LC1-UM06E8 Dimensions in mm (in)



LC1-UM06E8 Circuit diagram



LC1-UM06E8 Frequency response



LC1-UM06E8 Polar diagrams

Octave band sensitivity LC1-UM06E8

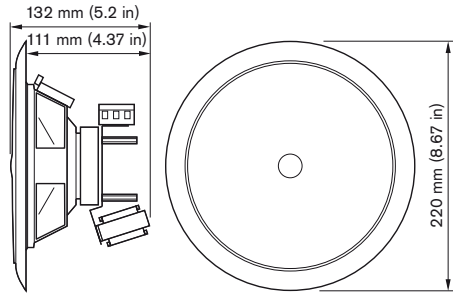
	Octave SPL 1W/1m	Total octave SPL 1W/1m	Total octave SPL Pmax/1m
125 Hz	93.4	-	-
250 Hz	88.4	-	-
500 Hz	86.3	-	-
1000 Hz	88.5	-	-
2000 Hz	91.4	-	-
4000 Hz	93.9	-	-
8000 Hz	92.6	-	-
A-weighted	-	88.9	95.8
Lin-weighted	-	90.4	96.5

Octave band opening angles LC1-UM06E8

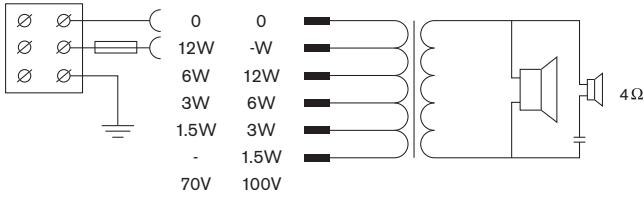
	Horizontal	Vertical
125 Hz	180	180
250 Hz	180	180
500 Hz	180	180
1000 Hz	180	180
2000 Hz	108	108
4000 Hz	62	62
8000 Hz	38	38

LC1-UM06E8 Acoustical performance specified per octave

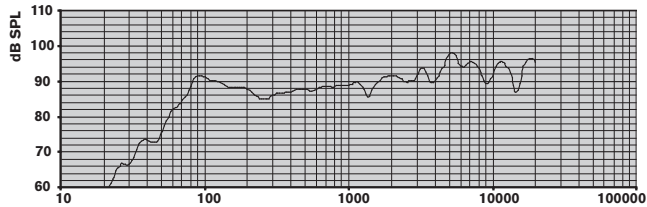
* (all measurements are done with a pink noise signal; the values are in dBSPL).



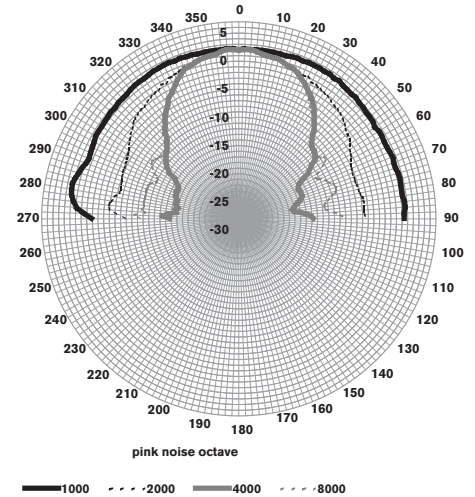
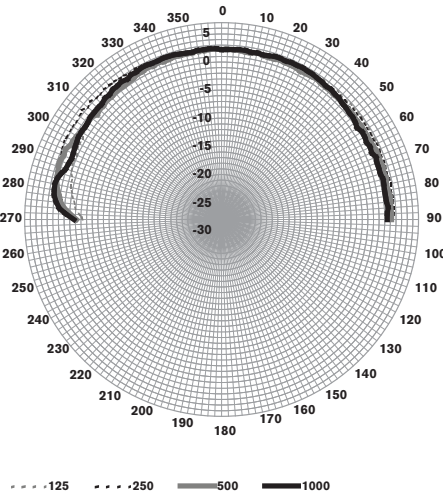
LC1-UM12E8 Dimensions in mm (in)



LC1-UM12E8 Circuit diagram



LC1-UM12E8 Frequency response



LC1-UM12E8 Polar diagrams

Octave band sensitivity LC1-UM12E8

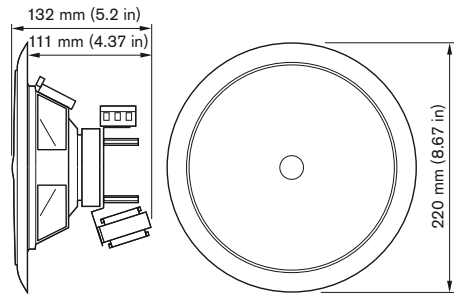
	Octave SPL 1W/1m	Total octave SPL 1W/1m	Total octave SPL Pmax/1m
125 Hz	89.4	-	-
250 Hz	87.3	-	-
500 Hz	86.5	-	-
1000 Hz	88.6	-	-
2000 Hz	90.0	-	-
4000 Hz	94.0	-	-
8000 Hz	93.7	-	-
A-weighted	-	88.9	99.3
Lin-weighted	-	90.3	100.2

Octave band opening angles LC1-UM12E8

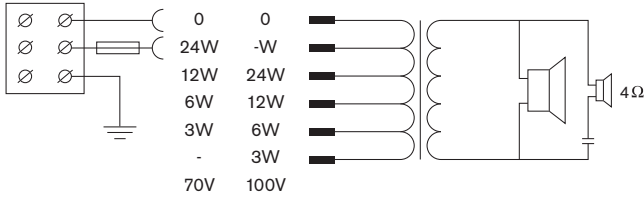
	Horizontal	Vertical
125 Hz	180	180
250 Hz	180	180
500 Hz	180	180
1000 Hz	180	180
2000 Hz	108	108
4000 Hz	64	64
8000 Hz	62	62

LC1-UM12E8 Acoustical performance specified per octave

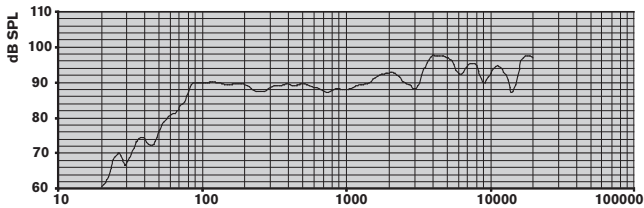
* (all measurements are done with a pink noise signal; the values are in dB SPL).



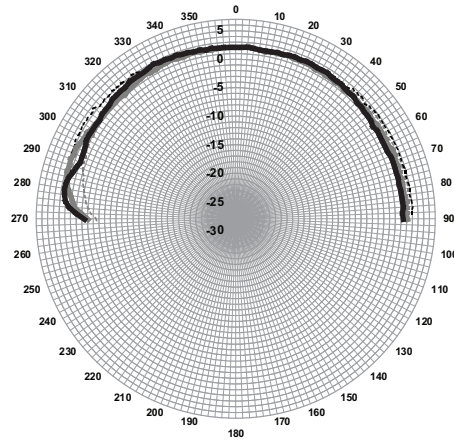
LC1-UM24E8 Dimensions in mm (in)



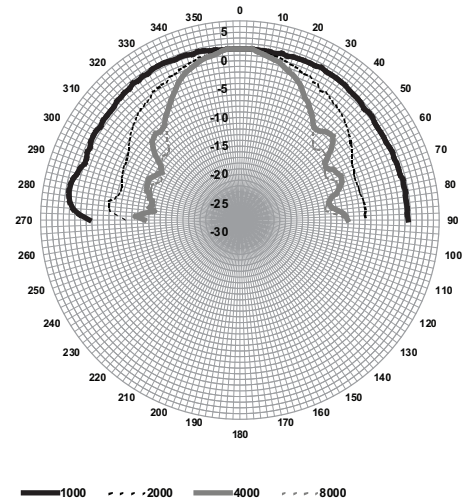
LC1-UM24E8 Circuit diagram



LC1-UM24E8 Frequency response



--- -125 --- -250 --- 500 --- 1000



LC1-UM24E8 Polar diagrams

Octave band sensitivity LC1-UM24E8

	Octave SPL 1W/1m	Total octave SPL 1W/1m	Total octave SPL Pmax/1m
125 Hz	89.9	-	-
250 Hz	88.3	-	-
500 Hz	89.0	-	-
1000 Hz	88.6	-	-
2000 Hz	91.5	-	-
4000 Hz	95.6	-	-
8000 Hz	93.8	-	-
A-weighted	-	90.0	103.1
Lin-weighted	-	91.3	103.8

Octave band opening angles LC1-UM24E8

	Horizontal	Vertical
125 Hz	180	180
250 Hz	180	180
500 Hz	180	180
1000 Hz	180	180
2000 Hz	106	106
4000 Hz	58	58
8000 Hz	57	57

LC1-UM24E8 Acoustical performance specified per octave

* (all measurements are done with a pink noise signal; the values are in dB SPL).

Parts Included

Quantity	Components
1	LC1-xMxxE8 Ceiling Loudspeaker
1	Installation instruction

Technical Specifications

Electrical*

	LC1-WM06E8	LC1-UM06E8
Description	Ceiling loudspeaker	Ceiling loudspeaker
Maximum power	9 W	9 W
Rated power	6 W (6 / 3 / 1.5 / 0.75 W)	6 W (6 / 3 / 1.5 / 0.75 W)
Sound Pressure Level at rated power / 1 W (1 kHz, 1 m)	96 dB / 88 dB	97 dB / 89 dB
Opening angle at 1 kHz / 4 kHz (-6 dB)	180° / 128°	180° / 62°
Effective frequency range (-10 dB)	85 Hz to 20 kHz	70 Hz to 20 kHz
Rated voltage	70 V / 100 V	70 V / 100 V
Rated impedance	835 / 1667 Ohm	835 / 1667 Ohm
Connector	3-pole screw-terminal block	3-pole screw-terminal block
	LC1-UM12E8	LC1-UM24E8
Description	Ceiling loudspeaker	Ceiling loudspeaker
Maximum power	18 W	36 W
Rated power	12 W (12 / 6 / 3 / 1.5 W)	24 W (24 / 12 / 6 / 3 W)
Sound Pressure Level at rated power / 1 W (1 kHz, 1 m)	100 dB / 89 dB	103 dB / 89 dB
Opening angle at 1 kHz / 4 kHz (-6 dB)	180° / 64°	180° / 58°
Effective frequency range (-10 dB)	55 Hz to 20 kHz	55 Hz to 20 kHz
Rated voltage	70 V / 100 V	70 V / 100 V
Rated impedance	418 / 833 Ohm	208 / 417 Ohm
Connector	3-pole screw-terminal block	3-pole screw-terminal block

* Technical performance data acc. to IEC 60268-5

Mechanical

	LC1-WM06E8	LC1-UM06E8
Description	Ceiling loudspeaker	Ceiling loudspeaker
Diameter	220 mm (8.67 in)	220 mm (8.67 in)
Maximum depth	111 mm (4.37 in)	111 mm (4.37 in)
Color	White (RAL 9010)	White (RAL 9010)
Material (frame / front grille)	Steel	Steel
Weight	1.18 kg (2.6 lb)	1.16 kg (2.56 lb)

	LC1-UM12E8	LC1-UM24E8
Description	Ceiling loudspeaker	Ceiling loudspeaker
Diameter	220 mm (8.67 in)	220 mm (8.67 in)
Maximum depth	111 mm (4.37 in)	111 mm (4.37 in)
Color	White (RAL 9010)	White (RAL 9010)
Material (frame / front grille)	Steel	Steel
Weight	1.3 kg (2.86 lb)	1.75 kg (3.86 lb)
	LC1-MMSB	LC1-CMR
Description	Mounting Support Bracket	Ceiling Mounting Ring
Dimensions	215 x 125 x 56 mm (8.47 x 4.92 x 2.2 in)	215 x 70 mm (8.47 x 2.75 in)
Mounting cut-out	190 mm (7.48 in)	200 mm (7.88 in)
	Cut-out template included	Cut-out template included
Max. ceiling thickness	50 mm (1.97 in)	25 mm (0.98 in)
Material	Steel	ABS
Color	Zinc plated	White (RAL 9010)
Weight	390 g (0.70 lb)	210 g (0.46 lb)
	LC1-CBB	LC1-CSMB
Description	Back Box	Surface Mounting Box
Dimensions	196 x 70 mm (7.72 x 2.75 in)	220 x 128 mm (8.67 x 5.04 in)
Material	ABS	ABS
Color	White (RAL 9010)	White (RAL 9010)
Weight	174 g (0.38 lb)	690 g (1.52 lb)
	LC1-MFB	LC1-PIB
Description	Metal Fire Dome (including ceramic connector)	Pilot-tone Indication Board
Dimensions	215 x 155 mm (8.47 x 6.1 in)	20 x 30 mm (0.78 x 1.18 in)
Mounting cut-out	190 mm (7.48 in)	n.a.
	Cut-out template included	n.a.
Material	Steel	n.a.
Color	Flame red (RAL 3000)	n.a.
Certified B15	According to DIN4102-8	n.a.
Weight	1 kg (2.20 lb)	3 g (0.006 lb)
	LM1-TB	LC1-MSK
Description	Tile Bridge / C-Ring	Metal Suspension Kit
Dimensions		
Chain length	n.a.	320 mm (12.59 in)
Tile rails	643 x 34 mm (25.33 x 1.34 in)	n.a.

	LM1-TB	LC1-MSK
C-Ring	250 x 30 mm (9.85 x 1.18 in)	n.a
Material	Steel	Steel
Color	Zinc plated	Zinc plated
Weight	939 g (2.07 lb)	174 g (0.38 lb)

Environmental

Operating temperature	-25 °C to +55 °C (-13 °F to +131 °F)
Storage temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Relative humidity	<95%

Ordering Information

LC1-WM06E8 Ceiling Loudspeaker 6 W	LC1-WM06E8
LC1-UM06E8 Ceiling Loudspeaker 6 W	LC1-UM06E8
LC1-UM12E8 Ceiling Loudspeaker 12 W	LC1-UM12E8
LC1-UM24E8 Ceiling Loudspeaker 24 W	LC1-UM24E8

Accessories

LC1-MMSB Mounting Support Bracket has two ceiling clamps, which are secured with thumb screws in the ceiling hole.	LC1-MMSB
LC1-CMR Mounting Ring an alternative for the ceiling mounting support bracket.	LC1-CMR
LC1-CBB Back Box prevents sound traveling via the ceiling cavity to adjacent areas, and fully protects the loudspeaker from dust, falling objects.	LC1-CBB
LC1-MFD Metal Fire Dome steel Fire Dome including ceramic terminal connector with cable loop through facility.	LC1-MFD
LC1-CSMB Surface Mounting Box for securing the ceiling loudspeaker to walls or hard ceilings.	LC1-CSMB
LC1-MSK Metal Suspension Kit accessory for single point suspension of the assembly of ceiling loudspeaker and surface mounting box	LC1-MSK
LC1-PIB Pilot Tone Indication Board PCB for optional visualisation of the presence of the pilot tone (type number contains six pieces).	LC1-PIB

Ordering Information**LM1-TB Tile Bridge / C-Ring**

used for reinforce the ceiling material and to spread out the pressure from the ceiling speaker clamps (type number contains two pieces).

LM1-TB

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