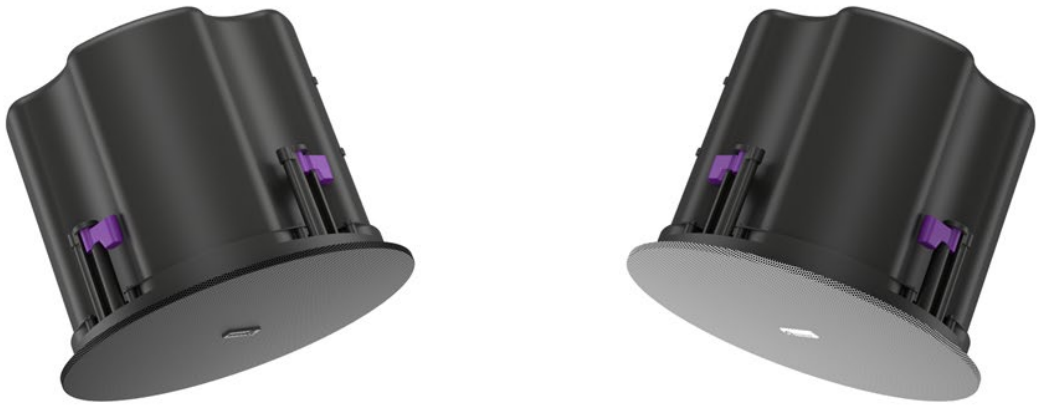
USER MANUAL

MODEL - CL-6P

High-Performance 6.5” in-ceiling, two-way Passive Speaker



P/N: 2900-301836 Rev 1

Contents

Introduction

Thank you for purchasing the Kramer CL-6P Speaker. This high-performance, 6.5” in-ceiling, two-way passive speaker delivers premium sound performance for commercial audio installations. Designed for both 8Ω and 70V/100V systems, it is ideal for speech applications such as meeting rooms, high end board rooms and auditoriums as well as for background music applications such as restaurants and cafeterias and hospitality applications.

Please read this manual carefully before installation to ensure optimal performance and safety.

Safety First!

- **Installations must be performed by a qualified professional following local regulations.**
- Ensure that the ceiling surface on which the speaker is installed can support the weight of the speaker.
- For installation in suspended acoustic ceiling grid, use the C-Ring that is supplied with the speaker together with the mounting rails (CSMR) which should be ordered separately.
- This speaker is intended for indoor installations, do not expose the speaker to excessive moisture or extreme temperatures.
- Always power off the amplifier before changing transformer tap settings or connecting the cable to the speaker.
- Always check amplifier compatibility before connecting (impedance setup, power ratings).
- Do not open the speaker housing, as this may affect the sound quality and will void the warranty.

Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer’s recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/il/quality/environment.

Included in the box

- 1 speaker (single unit), 2 speakers are packed in a single master box
- Installation kit including and C-ring and bolts (mounting rails are not included and should be purchased separately)
- 2 magnetic grills (1 white and 1 black per speaker)
- 4–pin pluggable Euroblock connector, 28–12AWG
- Cutout template
- Accessories (bracket bolts, UL cable passthrough, Silicon cable passthrough, zip tie for securing the speaker cable)
- Quick Start Guide

Overview

The CL-6P is a high-performance 6.5” in-ceiling passive speaker featuring exceptional sound, optimized for speech intelligibility, ideal for meeting rooms and paging applications.

The speaker supports both 8Ω low impedance as well as several 70V/100V high impedance modes.

The speaker is designed with front-access wiring and transformer tap and magnetic grill for easy installation & troubleshooting. The speaker is supplied with both white and black magnetic grills, the grills are with cloth and removable logo.

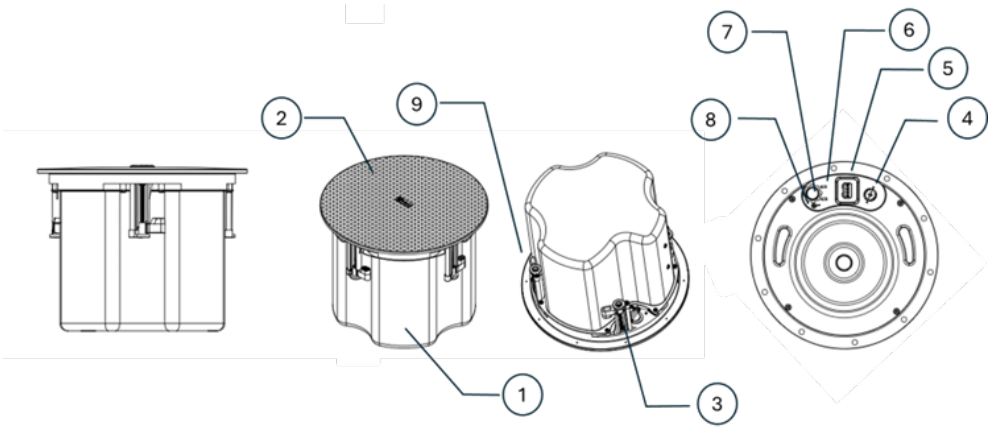


Figure 1 - CL-6P Speaker

#	Feature	Function
1	Speaker	Speakers body
2	Grill	Speaker’s grill
3	Mounting clamps (dog ears)	To be tightened against the back of the ceiling surface to hold the speaker in place
4	Transformer tap selector	For selecting between 8Ω low-impedance modes and 70V/100V high-impedance modes
5	Terminal connector	4-pin pluggable Euroblock connector, 28-12AWG for connecting the speaker cables
6	Cable tie points	Cable anchor points for strain relief
7	Cable passthrough	Passthrough hole for speaker cable
8	Grill securing hook	Hook for securing the magnetic grill
9	Safety anchor point	Safety anchor points for securing a seismic restraint cable

Key features

- Exceptional sound performance
- Low-impedance (8Ω) / high-impedance (70V/100V)
- Power handling: 30W continuous / 45W peak
- Sensitivity (1W@1m, free field): 88dB SPL
- Maximum SPL (@1m): Continuous 103dB SPL / Peak 105dB SPL
- UL1480A & UL2043 certified
- Eco-friendly mono-material packaging

Models

Model	Part Number	Description
CL-6P (SINGLE)	60-000126	6.5” Two-way In-Ceiling Passive Speaker

Typical Applications

CL-6P is ideal for a variety of typical applications, including:

- Applications requiring clear speech intelligibility, such as meeting rooms, board rooms and auditoriums.
- Background music applications, such as restaurants, Café & hospitality.

Installation Guide

Achieving Best Performance

To achieve the best performance:

- Use only good quality speaker cables (we recommend Kramer's plenum rated low smoke halogen free speaker cables, BC-2Sxx/LSHF).
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality

Choosing the Best Location

- **Plan Speaker Placement:** Plan the layout of the speakers based on the listening area, ceiling height, and the speaker's dispersion angle to ensure even sound coverage.
- **Ceiling Type Suitability:** Verify that the ceiling structure (e.g., suspended acoustic ceiling grid or drywall) can support the weight of the speaker and any necessary mounting accessories.
- **Obstruction Check:** Ensure the installation location is clear of obstructions such as HVAC ducts, electrical wiring, or plumbing lines.
- **Uniform Coverage:** For consistent audio performance, install speakers at equal distances from each other and from room boundaries, avoiding placement too close to walls or corners.
- **Avoid Reflective Surfaces:** Do not position speakers near highly reflective surfaces such as glass or tile, as these can cause unwanted echoes or coloration.
- **Accessibility:** Ensure the speaker's location allows for future access for service or adjustments if needed.

Unpacking

- Carefully unpack the speaker and all supplied accessories.
- Inspect all components for damage before proceeding.
- Dispose of the packaging materials according to regulations.

Mounting the Speaker

The ceiling speaker could be installed in a suspended acoustic ceiling grid by two methods:

- By using the dedicated ceiling mounting kit that includes a C-ring and a pair of tile-mounting rails (CSMR). The C-ring distributes the pressure applied by the dog ears and prevents damaging the ceiling tile while the tile mounting rails distribute the load to the ceiling tile grid.

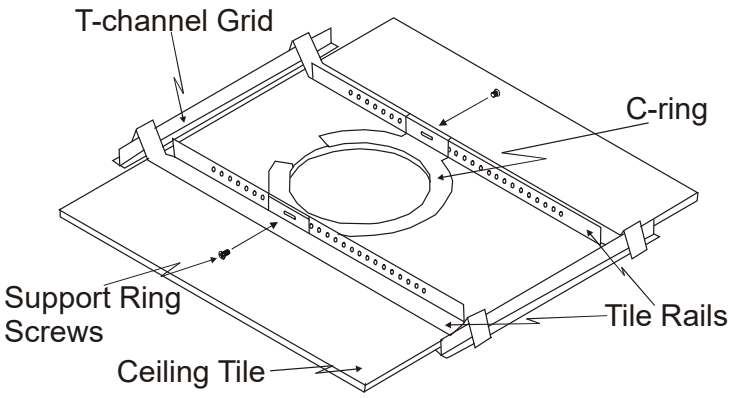


Figure 2 - Mounting the CL-6P in a suspended acoustic ceiling grid

Note: The C-ring is supplied with the speaker, the ceiling mounting rails (CSMR) should be purchased separately.

- By using a pre-cut wooden base in which the speaker is installed. In this case there is no need for the tile mounting rails, we do recommend using the C-ring (supplied with the speaker) to better distribute the pressure applied by the dog ears to the wooden plate.

Installation guide

- Remove the ceiling tile where you plan to install the speaker.
- Use the supplied cutout template to trace and cut the speaker hole in the ceiling tile. Ensure the center of the cutout aligns with the center of the tile.
- Insert the speaker into the tile, ensuring the visible side of the tile is facing downward.
- Place the C-ring and mounting rails above the tile. **Do not** fasten the mounting rails to the C-ring at this stage.
- Using a screwdriver, fasten the dog-ears to the C-ring. Ensure the dog-ears grip the C-ring and **do not** come into direct contact with the tile, as this may damage it. **Do not** overtighten the dog-ears.
- Place the tile with the speaker in its designated location in the ceiling grid. Ensure the mounting rails properly engage the grid, then fasten them to the C-ring using the supplied bolts.
- Pass the speaker cable through the designated hole in the baffle and through the cable passthrough cap (either the silicone cap or the metal cap).
- Connect the speaker wires to the terminal connector. We recommend maintaining consistent color coding—for example: red wires to positive (+) terminals and black wires to negative (–) terminals.

- Plug the terminal connector into the socket.
- Secure the speaker cable using the supplied zip tie.
- Set the transformer tap to the desired setting.
- Attach the magnetic grille to the grille securing hook and place it into position

Wiring the Speakers – best practice

Your passive speaker features both low impedance (8Ω) and high impedance (70V/100V) modes. Understanding the difference is essential for safe installation and optimal performance.

Low Impedance Installation (8 Ohms)

Description:

In low impedance setup the speaker is connected directly to a low-impedance amplifier (typically rated at 4Ω, 8Ω, or 16Ω). This method is commonly used in small to medium-sized rooms where the amplifier is near the speakers, such as meeting rooms, boardrooms, or home studios.

Note: In low impedance mode the **CL-6P** has an impedance of 8Ω.

Key Features:

- Higher sound quality due to full-range signal.
- Limited cable runs (usually less than 20 meters).
- One amplifier channel per speaker or a pair of speakers.

High Impedance Installation (70V / 100V)

Description:

This method uses a transformer to distribute audio over long distances using thin speaker cables. Ideal for large areas or multi-speaker installations such as retail stores, restaurants, schools, or outdoor spaces.

Key Features:

- Supports multiple speakers on a single amplifier channel, installed in parallel.
- Long cable runs (up to hundreds of meters) without significant loss.

Note: In high impedance mode the **CL-6P** supports the following power ratings:

  - at 100V – 30W / 15W / 7.5W
  - at 70V – 30W / 15W / 7.5W / 3.8W

When to Choose a Low Impedance 8Ω Setup

- **When Sound Quality Is Top Priority**
  - 8Ω setups deliver **direct, full-bandwidth signal** from the amplifier to the speaker - **no transformer losses**.
  - Ideal for:
    - Boardrooms and conference rooms
    - Auditoriums or lecture halls
    - Music-focused zones (bars, studios, luxury retail)
- **When You Have a Small Speaker Count**
  - A typical low-impedance amp channel supports 1 to 2 speakers per channel, maybe 4 if impedance allows.
  - Perfect if:
    - You're wiring 1–4 speakers to a single amplifier channel.
    - You don't need multiple zones from one line.
- **When Cable Runs Are Short**
  - Ideal for speaker cables under 30–50 meters (100-164 ft)
  - No need to compensate for long-distance power loss with transformers.
- **When You Want to Use Subwoofers or High-Power Speakers**
  - Low-impedance amps can directly deliver the necessary wattage.
- **When You Need High SPL or Full-Range Performance**
  - Transformer-based 70V/100V systems often cut low frequencies to protect transformers and reduce core size.
  - For full-range systems where bass and clarity matter - 8Ω wins.

When to Use high impedance 70V/100V Line Systems

Use a 70V (North America) or 100V (ROW) system when:

- **Long Cable Runs** (Typically >50–60m)

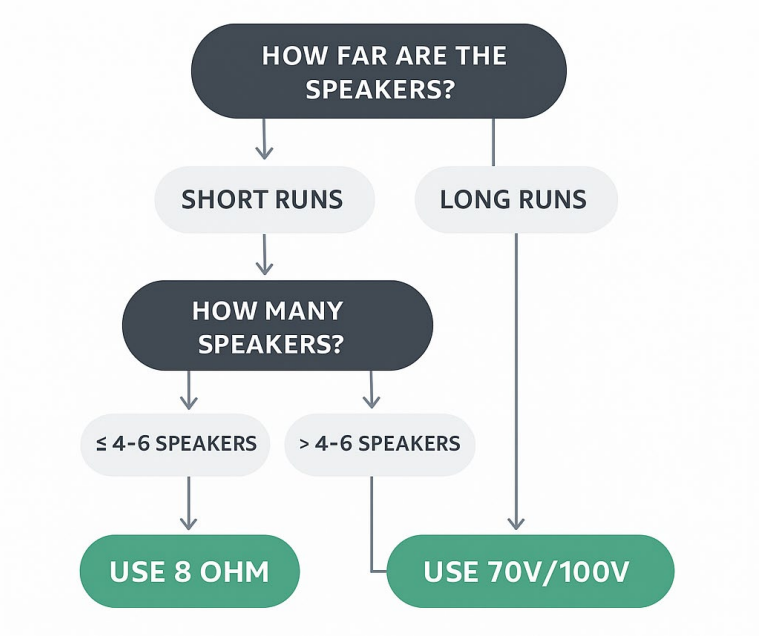
In low-impedance systems, long runs require very thick cables to avoid losses. High-impedance systems reduce current, allowing the use of thinner and longer cables.

- **Multiple Speakers Across Large Areas**

Ideal for distributed audio (e.g., malls, schools, campuses, offices).
Each speaker has a tap setting to draw only the needed wattage.

- **Simpler Infrastructure & Scalability**

One amplifier can drive dozens of speakers in parallel with no complex impedance matching.
Makes zoning and volume control easier with transformers.



Note: In the U.S., 70V audio systems are standard because they stay just under the 100V peak limit defined by safety regulations, avoiding high-voltage installation requirements. In most other countries, 100V systems are common because local electrical standards allow higher voltages in low-current applications. The key advantage of 100V systems is that they deliver more power over longer distances with thinner cables, making them ideal for large-scale distributed audio installations.

Designing a low impedance system

Impedance (measured in ohms, Ω) tells us how much resistance a speaker gives to the amplifier. When connecting multiple speakers to one amplifier channel, the **total impedance** depends on how you wire them: in **series** or in **parallel**.

Series (In Line) Connection

In a series connection, you connect the **positive of one speaker to the negative of the next**. The total impedance is the **sum** of all speaker impedances.

Formula: Total Impedance (Z) = Z_1 + Z_2 + ... + Zn

Example:
Two 8Ω speakers in series:
8Ω + 8Ω = 16Ω total impedance

Note: Use series wiring if your amplifier supports higher impedance or you want to reduce the power output slightly.

Parallel Connection

In a parallel connection, all speaker **positives go to the amp's positive**, and all **negatives to the amp's negative**. The total impedance **decreases** and is calculated using:

Formula (for 2 speakers):
1 / Z_total = 1 / Z_1 + 1 / Z_2 , then flip the result.

Example:
Two 8Ω speakers in parallel:
1 / Z = 1/8 + 1/8 = 2/8 → Z = 4Ω total impedance

Note: Use parallel wiring if your amplifier supports a **4Ω load** - this gives **more power** but also puts **more strain** on the amplifier.

Recommended cable gage based on impedance and maximum distance:

Setup / Distance	Single 8Ω Speaker	2 x 8Ω in Parallel (4Ω)	2 x 8Ω in Series (16Ω)
Up to 10m / 33ft	16 AWG / 1.31mm2	14 AWG / 2.08mm2	16 AWG / 1.31mm2
Up to 20m / 66	14 AWG / 2.08mm2	12 AWG / 3.31mm2	16 AWG / 1.31mm2
Up to 30m / 100ft	12 AWG / 3.31mm2	10 AWG / 5.26mm2	14 AWG / 2.08mm2
Up to 40m / 132ft	10 AWG / 5.26mm2	10 AWG / 5.26mm2	12 AWG / 3.31mm2

Designing a high impedance system

Choosing the correct speaker cable is essential for reliable performance and long-term system efficiency, especially in 70V/100V high-impedance systems where cables can span over 100 meters.

Key Design Steps

1. **Calculate Total Speaker Load -** Add the wattage of all speakers on each cable run

   Example: 4 × 30W = 120W total load

2. **Measure Cable Run Length -** Measure the full round-trip length (amplifier to last speaker and back).

3. **Select Cable Size (Gauge)** - Use the following table to choose your cable size for a maximum 0.5dB loss (≈11%):

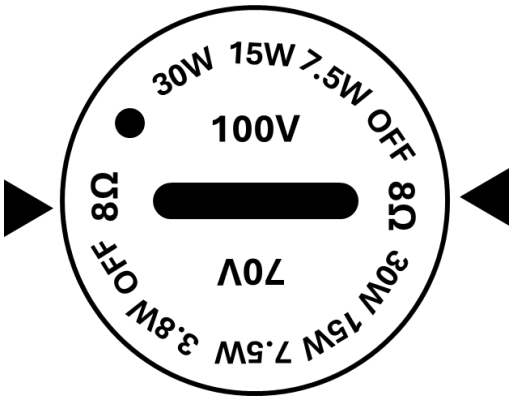
Total Load / Cable Gauge	30W	90W	150W	300W
16 AWG (1.31mm²)	180m / 590ft	60m / 200ft	36m / 118ft	18m / 60ft
14 AWG (2.08mm²)	290m / 950ft	96m / 315ft	58m / 190ft	29m / 95ft
12 AWG (3.31mm²)	460m / 1500ft	153m / 500ft	92m / 300ft	46m / 150ft
10 AWG (5.26mm²)	730m / 2400ft	243m / 795ft	146m / 480ft	73m / 240ft

Note: These are **maximum total distances** for the **entire run**, based on copper cable and a 5% voltage drop.

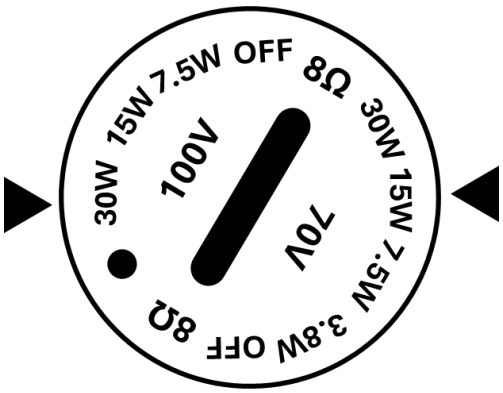
Setting up speaker power handling mode

Your speaker includes a rotary transformer tap for setting the power handling mode.

To set the speaker to 8Ω low impedances, set the transformer tap so the 2 arrows will point at the 8Ω markings as shown in the picture:



To set the speaker to a high impedance mode set the transformer tap to the desired power rating as shown in the picture. In this example, if the speaker is connected to a 100V line its power rating will be 30W and if connected to a 70V line its power rating will 15W.



Always power off the amplifier before changing transformer tap settings or connecting the terminal connector to the speaker

Always check amplifier compatibility before connecting (impedance setup, power ratings)

Verify that the polarity of the wiring at the amplifier side and at all the speaker is correct, we recommend using color coding: red for + and black for -.

Parallel wiring and daisy chain installations

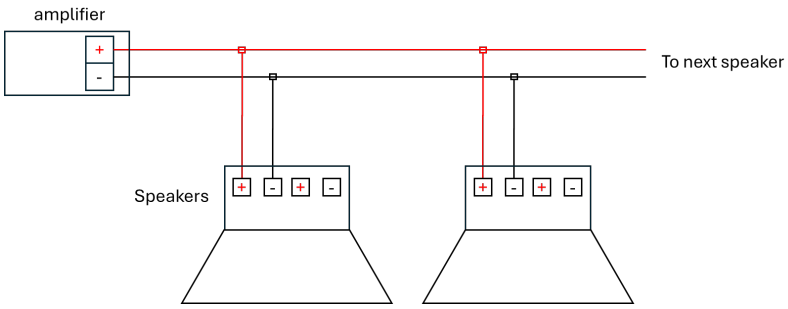


Figure 3 - Parallel Wiring

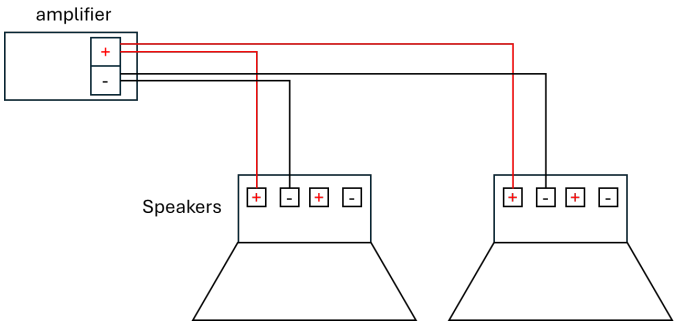


Figure 4 -Parallel Wiring - Separate Cables

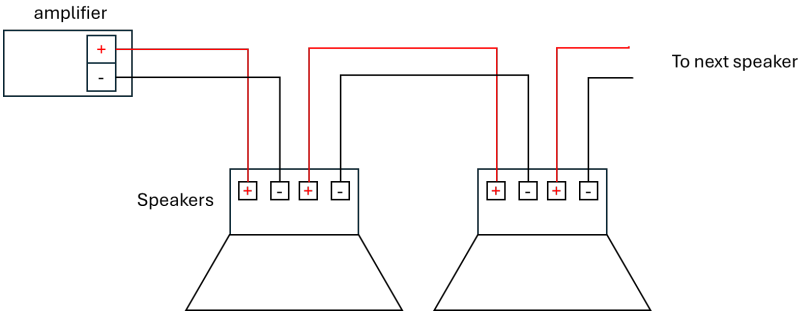


Figure 5 - Daisy Chain Wiring

Defining and calculating speaker's sound pressure levels (SPL)

The recommended SPL (Sound Pressure Level) for different applications depends on the purpose of the audio (e.g., speech, background music, or announcements) and the ambient noise level of the environment.

Here's a practical reference chart for commonly encountered commercial spaces:

Application	Recommended SPL	Purpose	Notes
Meeting Rooms	65–70 dB SPL	Speech clarity	Keep just above ambient noise; avoid listener fatigue
Classrooms	65–75 dB SPL	Speech + AV audio	Aim for clear intelligibility at the back of the room
Cafeterias	75–80 dB SPL	Announcements, ambient music	Slightly louder to overcome crowd noise
Restaurants	70–75 dB SPL	Background music, paging	Should not interfere with conversation
Retail Stores	70–78 dB SPL	Background music, ads	Volume can vary by vibe/brand identity
Offices (Open Space)	60–68 dB SPL	Paging, low-level BGM	Soft enough to not distract, but audible
Lobbies & Corridors	68–72 dB SPL	Announcements, background music	Balanced to avoid echo and blending with ambient noise
Factories / Warehouses	85–90 dB SPL	Announcements, alarms	Must exceed ambient noise for clarity and safety
Outdoor Areas	75–85 dB SPL	Paging, music	Depends heavily on environmental noise and coverage area
Auditoriums	80–95 dB SPL	Speech, music, live events	High dynamic range required; use zoning and delay speakers

Calculating speaker's sound pressure level (SPL)

To calculate the **Sound Pressure Level (SPL)** at a given distance from a speaker, based on its **sensitivity rating** and **input power**, you can use the following formula:

$$\mathbf{SPL_X = SPL_{ref} + 10 \cdot \log_{10}(P) - 20 \cdot \log_{10}(d)}$$

Where:

- **SPL_X** = Sound Pressure Level at distance *x* (in dB SPL)
- **SPL_{ref}** = Speaker sensitivity (usually given as SPL at 1W @ 1 meter)
- **P** = Input power in watts
- **d** = Distance from the speaker in meters

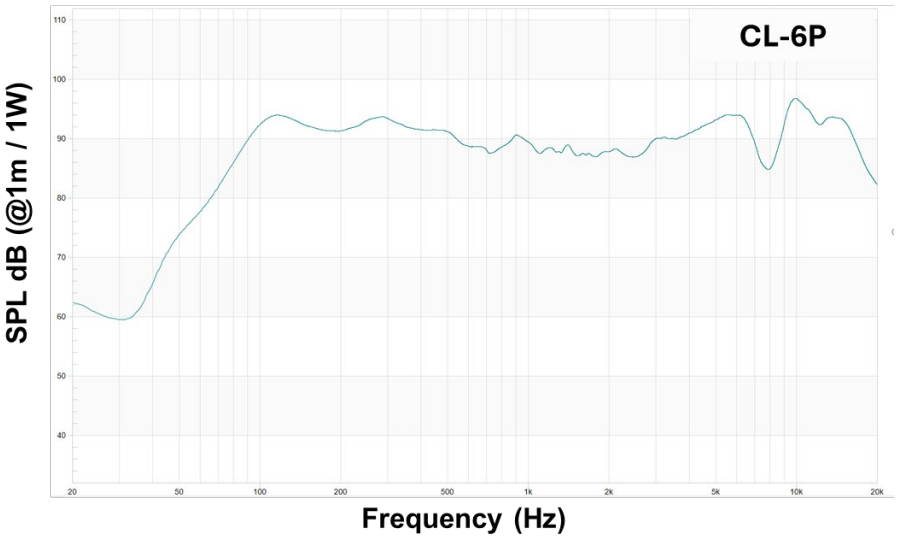
Example: With a **CL-6P** with 88dB sensitivity, driven by a 30W amplifier, the sound pressure level 3 meters from the speaker will be:

$$\mathbf{SPL_{3m} = 88 + 10 \cdot \log_{10}(30) - 20 \cdot \log_{10}(3) = 93.2\ dB\ SPL}$$

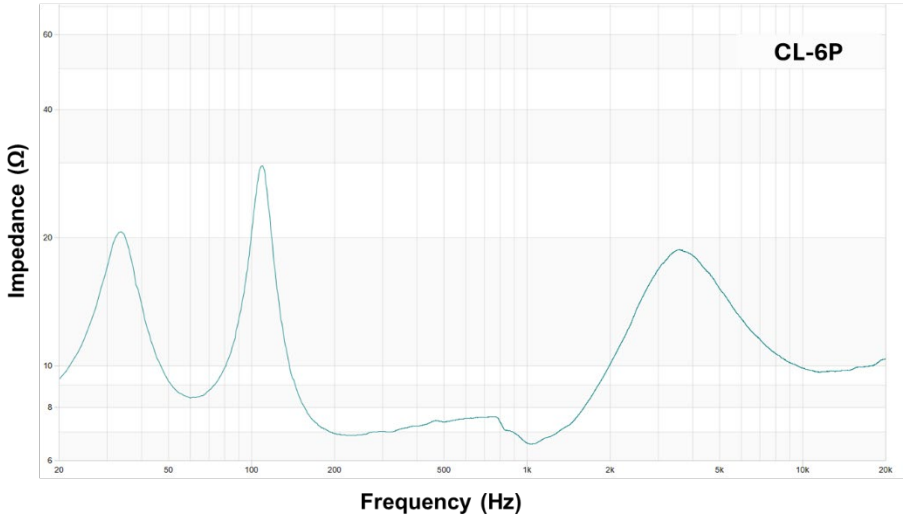
Technical Specifications

Model	CL-6P
Audio Specifications	
Drivers	
LF Driver	165 mm (6.5”) driver with polypropylene cone and rubber surround
HF Driver	19 mm (0.75 in) liquid cooled soft–dome tweeter
Frequency Characteristics	
Frequency Range (-10dB)	70Hz-20kHz
Frequency Response (±3dB)	80Hz-18kHz
Power Handling	
Power Handling	30W continues / 45W peak
Impedance	8Ω
Multi tap transformer settings	70V: 30W / 15W / 7.5W / 3.8W 100V: 30W / 15W / 7.5W
Acoustical parameters	
Sensitivity (1W@1m)	88dB
Maximum continuous SPL (dB) @1m	Continuous: 103dB SPL / Peak: 105dB SPL
Dispersion	106°
Mechanical specifications	
Installation	
Type	In–ceiling speaker installation with brackets and C–ring
Mounting	4–point screw down Dog–Ear clamp, up to 60mm / 2.36” ceiling thickness
Connectors	4–pin pluggable Euroblock connector, 28–12AWG
Weight per single speaker	3.75kg (8.27lbs)
Dimensions	
Depth (ceiling clearance)	220mm / 8.66”
Back enclosure outer diameter	250mm / 9.84”
Cutout diameter	252mm / 9.92”
Grill diameter	282mm / 11.1”
Shipping	
Shipping Dimensions (single unit)	400mm x 400mm x 298mm / 15.8" x 15.8" x 11.8"
Number of units in the master box	2
Shipping Dimensions in master box	410mm x 410mm x 618mm / 16.14" x 16.14" x 24.33"
Shipping weight (single unit)	5.42KG / 11.95lbs
Shipping weight master box	11.62KG / 25.62lbs
Packaging	Packed as single, 2 singles packed in a master box
Packaging Materials	Eco-friendly mono-material packaging made entirely from recyclable carton, designed for durability and ease of recycling
Materials	
Grill	Black/White Powder Coated Steel, Magnetic, with cloth, paintable, removable logo
Baffle	V-0 Flame Retardant
Back Enclosure / Cabinet	Powder–coated steel
Environmental	
Operating Temperature:	-5°C to +50°C (23°F to 122°F)
Storage Temperature:	-10°C to +55°C (14°F to 131°F)
Humidity	30% to 85%, RHL non-condensing
Regulatory Compliance	
Safety	UL1480A, UL2043, CE, UKCA
Environmental	RoHS, REACH, WEEE

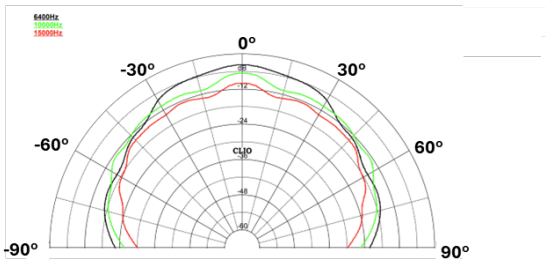
Frequency Response

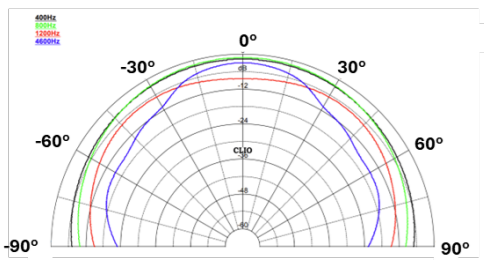


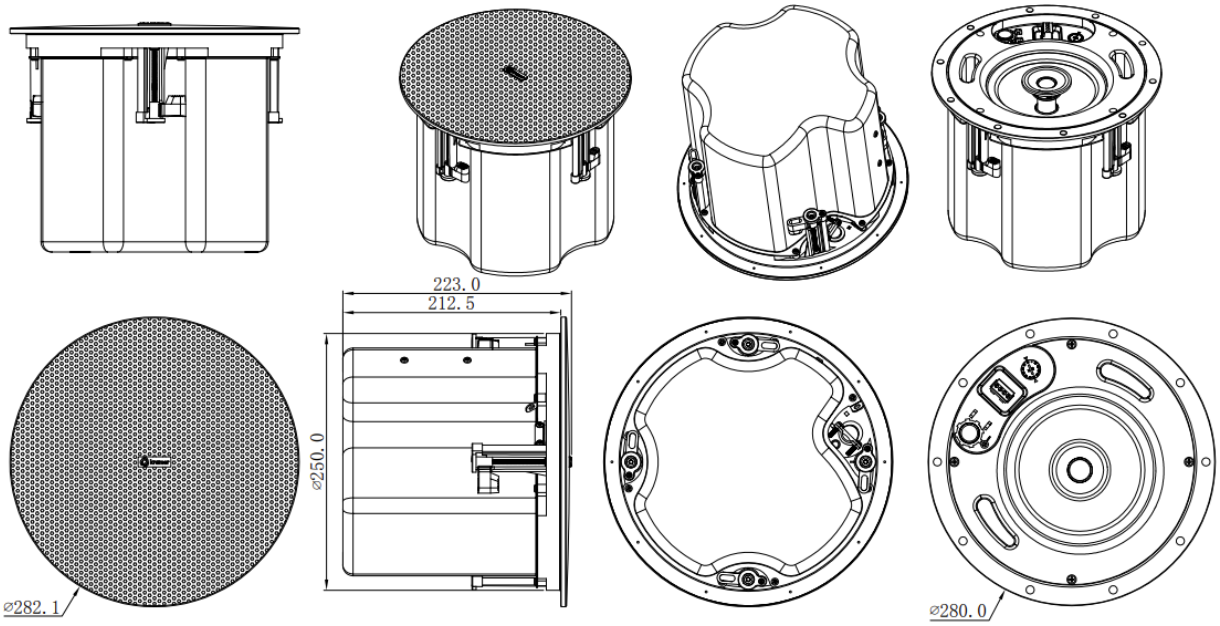
Impedance Response



CL-6P - Polar Graphs



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We welcome your questions, comments, and feedback

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