USER MANUAL

MODEL - CL-8P-SUB

8” in-ceiling Passive subwoofer

P/N: 2900-301864 Rev 1

Contents

Introduction

Thank you for purchasing the Kramer CL-8P-SUB In-Ceiling Passive Subwoofer. This high-performance 8” subwoofer enhances any space with deep, rich bass, seamlessly integrating into the ceiling for a clean and professional look. Designed to complement commercial audio installations, the CL-8P-SUB is suitable for both low impedance (8Ω) and high impedance (70V/100V) systems, offering exceptional flexibility for a wide range of applications, including auditoriums, high-end boardrooms, hotel lobbies, and shopping malls. Bezel-less black and white magnetic grills are provided in the box.

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 CL-8P-SUB speaker (single unit)
- 2 magnetic grills (1 white and 1 black)
- 4-pin pluggable Euroblock connector, 28-12AWG
- Cutout template
- Accessories (C-ring, bracket bolts, UL cable passthrough, Silicon cable passthrough, zip tie for securing the speaker cable)
- Quick start guide

Overview

The **CL-8P-SUB** is a high-performance 8” in-ceiling passive speaker featuring exceptional sound, optimized for speech intelligibility, ideal for auditoriums, board rooms and high ceiling 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.

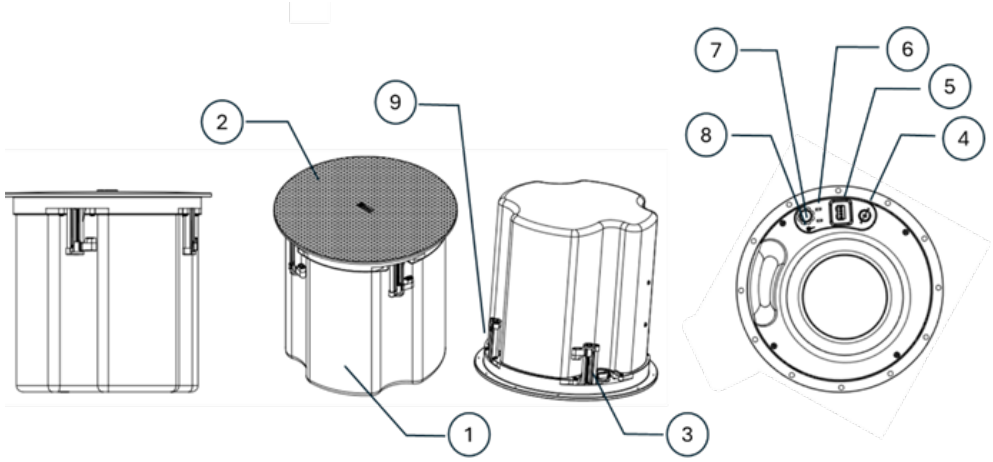


Figure 1 - CL-8P-SUB Speaker

#	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	Grill securing hook	Hook for securing the magnetic grill
8	Cable passthrough	Passthrough hole for speaker cable
9	Safety anchor point	Safety anchor points for securing a seismic restraint cable

Key features

- Premium sound with high SPL
- Low-impedance (8Ω) / high-impedance (70V/100V)
- Power ratings: 80 W (rms) continuous / 120 W peak
- Sensitivity (1W@1m, free field): 84dB SPL
- Maximum SPL (@1m): Continuous: 103dB SPL / Peak: 105dB SPL
- Plenum rated - UL2043 certified / UL1480A certified for indoor installations
- Industrial design: Black & white bezel-less grills included in the box, removable logo
- Eco-friendly mono-material packaging

Models

Model	Part Number	Description
CL-8P-SUB (SINGLE)	60-000127	8” In-Ceiling Passive subwoofer

Typical Applications

CL-8P-SUB is ideal for a variety of typical applications, including:

- Enhancing the sound in every space
- Auditoriums
- Restaurants, hotels and hospitality applications

Installation Guide

Unpacking

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

Achieving Best Performance

To achieve the best performance:

- **Use High-Quality Speaker Cables:** We recommend using Kramer's plenum-rated, low smoke, halogen-free speaker cables (e.g., BC-2Sxx/LSHF) for optimal audio performance and safety compliance.
- **Avoid Tight Bundling:** Do not secure the cables in tight bundles or roll excess cable into tight coils, as this can degrade signal quality and introduce unwanted interference.
- **Minimize Interference:** Position the speaker cables away from electrical appliances and power cables that might introduce noise or affect audio clarity.

Choosing the Best Location

- **Plan Subwoofer Placement:** Position the subwoofer to complement the main speaker system, considering the listening area, ceiling height, and room acoustics. Subwoofers generally perform best near room boundaries (walls or corners) to take advantage of boundary reinforcement and enhance low-frequency output.
- **Ceiling Type Suitability:** Ensure that the ceiling structure (e.g., suspended acoustic ceiling grid or drywall) can support the weight of the subwoofer and any necessary mounting accessories. Use proper hardware to ensure secure installation.
- **Obstruction Check:** Confirm that the installation location is free of obstructions such as HVAC ducts, electrical wiring, or plumbing lines that could interfere with installation or compromise performance.
- **Avoid Symmetry Issues:** To achieve balanced bass response, avoid placing subwoofers in perfectly symmetrical positions (e.g., dead center of the room), as this can lead to standing waves and uneven bass coverage.
- **Avoid Reflective Surfaces:** Position the subwoofer away from highly reflective surfaces such as glass or tile, which can cause phase issues or unwanted resonances.
- **Accessibility:** Ensure the subwoofer's location allows for future access for service, adjustments, and cable connections as needed.

Avoiding Vibrations

- **Understand Low-Frequency Behavior:** Subwoofers generate low-frequency audio (large wavelengths) and move significant amounts of air. These frequencies can pass through walls, disturb neighboring rooms, and cause mechanical vibrations in the ceiling and surrounding structures.
- **Test Across Frequencies:** After installation, play a variety of low-frequency test tones (e.g., sine sweeps, pink noise) to identify any unwanted vibrations or rattling in the ceiling or adjacent structures.
- **Electronic Attenuation:** If vibrations or rattling occur, consider electronically attenuating the frequencies causing the vibrations. This limits the amount of low-frequency energy exciting the structure while preserving sound quality.
- **Secure Mounting:** Ensure that the subwoofer is properly and securely fastened to the ceiling using the recommended mounting hardware. Tighten all screws and brackets to prevent movement or rattling during operation.
- **Inspect Surrounding Structures:** Check that all ceiling tiles, panels, and nearby fixtures are secure and will not rattle during subwoofer use. Reinforce or secure them as necessary.

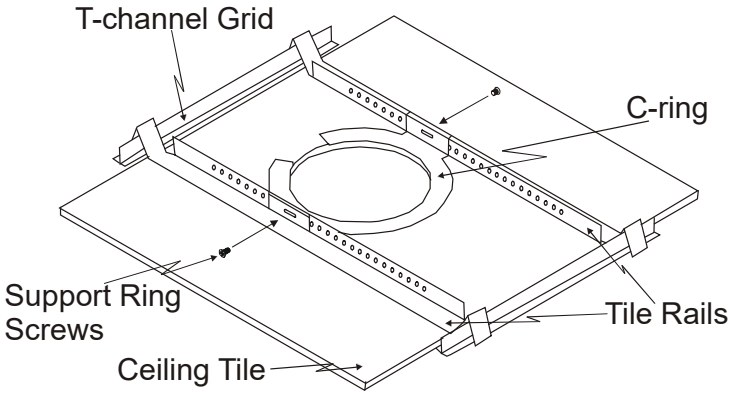
Installation Guide

- The CL-8P-SUB can be installed in a suspended acoustic ceiling grid using two methods:
  - **Using the Dedicated Ceiling Mounting Kit:**
    This kit includes a C-ring (supplied with the speaker) and an optional pair of tile-mounting rails (CSMR, purchased separately). The C-ring helps distribute the pressure applied by the dog ears to prevent damage to the ceiling tile, while the tile-mounting rails distribute the load to the ceiling grid.
  - **Using a Pre-Cut Wooden Base:**
    The subwoofer can also be installed using a pre-cut wooden base. In this case, the tile-mounting rails are not required. However, it is still recommended to use the supplied C-ring to evenly distribute the load on the wooden base.

Recommended Installation Steps

- **Important:** Before installing the subwoofer, ensure that the ceiling grid is properly secured to the ceiling structure and can safely support the subwoofer's weight. Once verified, install the ceiling tile or wooden base into the ceiling grid. Finally, install the subwoofer into the prepared tile or wooden base. This sequence ensures safe and stable installation and prevents damage or accidents.

- **Prepare the Ceiling Tile or Wooden Base:**
  - **For Ceiling Tiles:** Remove the ceiling tile where you plan to install the subwoofer. Use the supplied cutout template to trace and cut the subwoofer hole in the tile during the installation process. Ensure that the center of the cutout aligns with the center of the tile for optimal placement.
  - **For Wooden Bases:** Prepare the wooden base in advance according to the specified dimensions in the product manual. Trace the hole in the ceiling tile by using the wooden base itself as the guide (instead of the supplied cutout template). This ensures the subwoofer hole in the ceiling tile aligns correctly with the pre-cut wooden base.
- **Place the Tile or Wooden Base into the Ceiling Grid:**
  - Carefully place the cut ceiling tile (or wooden base) back into its designated location in the ceiling grid. Ensure it is properly seated and supported by the grid.
  - If using the tile-mounting rails (CSMR), position them above the ceiling tile to distribute the weight evenly across the ceiling grid.
- **Insert the Subwoofer into the Installed Tile or Wooden Base:**
  - Insert the subwoofer into the cutout hole from below, ensuring that the front face of the subwoofer is flush with the ceiling surface.
  - Place the supplied C-ring above the ceiling tile or wooden base, aligning it with the subwoofer opening.
  - Using a screwdriver, fasten the dog ears to the C-ring. Ensure the dog ears grip the C-ring and do not directly contact the ceiling tile or wooden base to avoid damage. Do not overtighten the dog ears.
- **Fasten the Mounting Rails (if used):**
  - Secure the mounting rails to the C-ring using the supplied bolts to distribute the weight evenly and ensure the subwoofer is properly supported.
- **Connect the Speaker Wiring:**
  - 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, maintaining consistent color coding—for example: red wires to positive (+) terminals and black wires to negative (–) terminals.
  - Plug the terminal connector into the subwoofer socket and secure the speaker cable using the supplied zip tie.
- **Set the Transformer Tap:**
  - Adjust the transformer tap to the desired setting for your system configuration.
- **Attach the Magnetic Grille:**
  - Snap the magnetic grille to the subwoofer’s grille securing hook and place it into position.



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

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-8P-SUB** 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-8P-SUB** supports the following power ratings:

  - at 100V – 80W / 40W / 20W
  - at 70V – 80W / 40W / 20W / 10W

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)

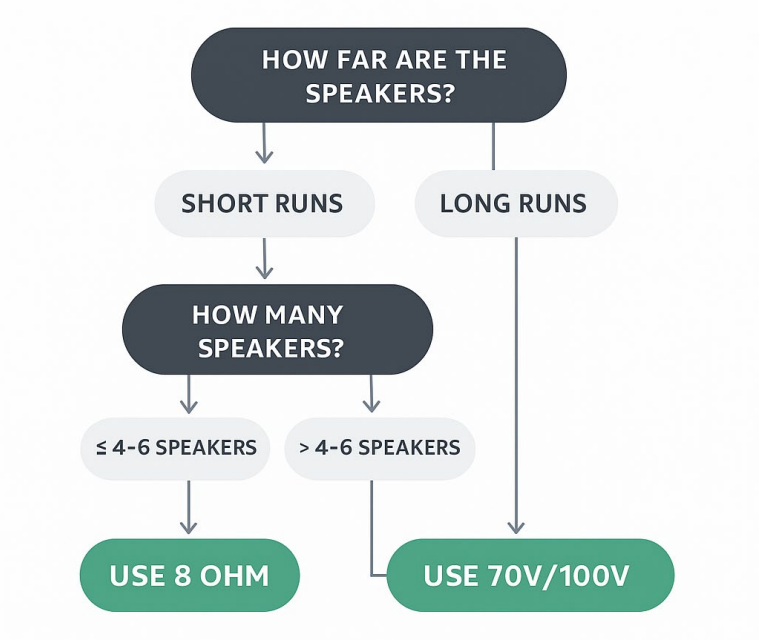
In low-impedance systems, long runs require very thick cables to avoid losses. High-impedance systems reduce current, allowing the use of thinner and longer cables.

- **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%):

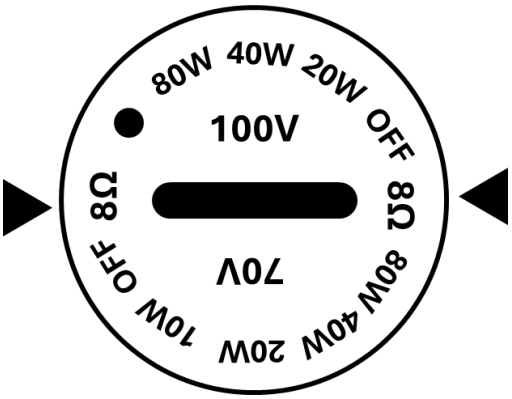
Total Load / Cable Gauge	30W	90W	150W	300W
16 AWG (1.31mm²)	180m / 590ft	60m / 200ft	36m / 118ft	18m / 60ft
14 AWG (2.08mm²)	290m / 950ft	96m / 315ft	58m / 190ft	29m / 95ft
12 AWG (3.31mm²)	460m / 1500ft	153m / 500ft	92m / 300ft	46m / 150ft
10 AWG (5.26mm²)	730m / 2400ft	243m / 795ft	146m / 480ft	73m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

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

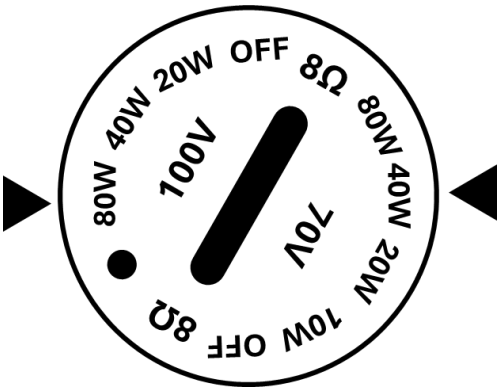
Setting up speaker power handling mode

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 80W and if connected to a 70V line its power rating will 40W.



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

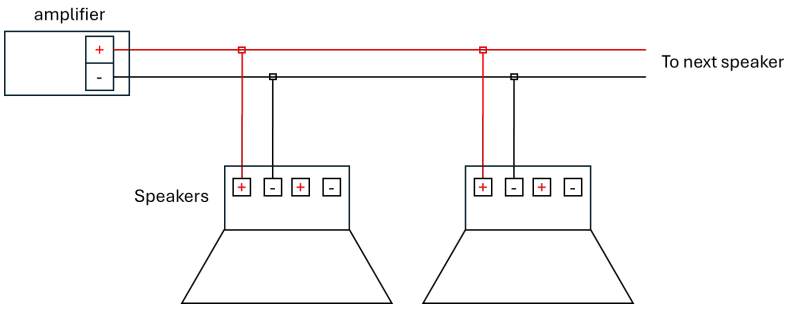


Figure 2 - Parallel Wiring

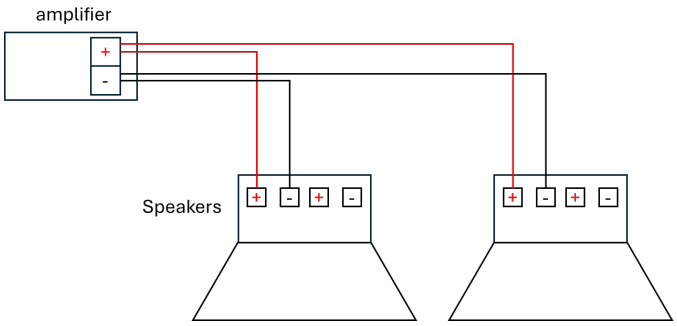


Figure 3 -Parallel Wiring - Separate Cables

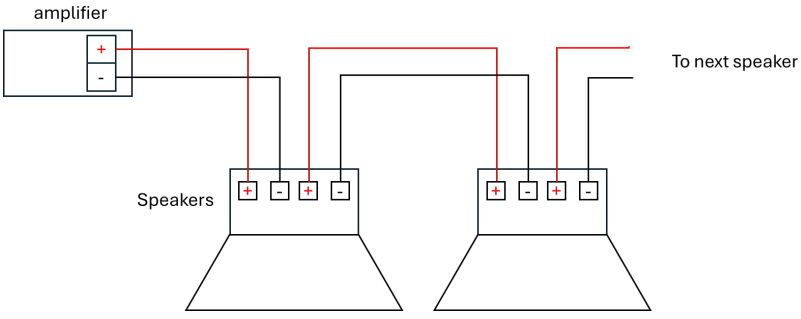


Figure 4 - Daisy Chain Wiring

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	Purpose	Recommended speakers SPL	Recommended subwoofer SPL	Notes
Meeting Rooms	Speech clarity	65–70 dB SPL	65–70 dB SPL	Keep subwoofer subtle; avoid overshadowing speech.
Classrooms	Speech + AV audio	65–75 dB SPL	70–75 dB SPL	Subwoofer can add impact to multimedia but must not mask speech.
Cafeterias	Announcements, ambient music	75–80 dB SPL	75–80 dB SPL	Subwoofer provides warmth; recommended but not essential.
Restaurants	Background music, paging	70–75 dB SPL	70–75 dB SPL	Subwoofer helps with low-end ambience; avoid interfering with conversation.
Retail Stores	Background music, ads	70–78 dB SPL	70–78 dB SPL	Subwoofer enhances music and brand atmosphere.
Offices (Open Space)	Paging, low-level BGM	60–68 dB SPL	60–68 dB SPL	Subwoofer optional; minimal low-end needed to avoid distractions.
Lobbies & Corridors	Announcements, background music	68–72 dB SPL	68–72 dB SPL	Subwoofer adds warmth; ensure clarity for paging.
Factories / Warehouses	Announcements, alarms	85–90 dB SPL	85–90 dB SPL	Subwoofer optional; prioritize clear announcements over low-end impact.
Outdoor Areas	Paging, music	75–85 dB SPL	75–85 dB SPL	Subwoofer useful for music; adjust levels to environment.
Auditoriums	Speech, music, live events	80–95 dB SPL	80–95 dB SPL	Subwoofer essential for full-range sound; dynamic content may require additional headroom.

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:

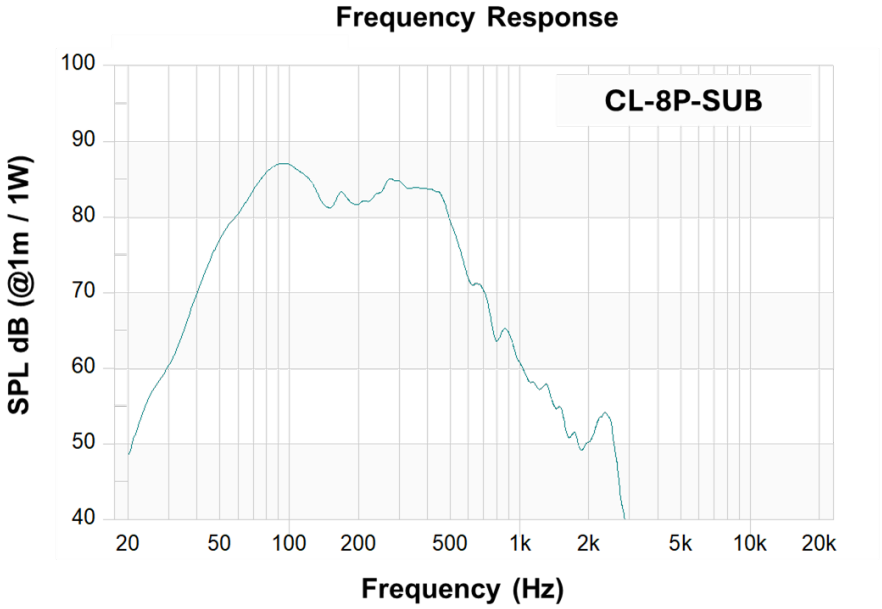
- **SPL_X** = Sound Pressure Level at distance *x* (in dB SPL)
- **SPL_{ref}** = Speaker sensitivity (usually given as SPL at 1W @ 1 meter)
- **P** = Input power in watts
- **d** = Distance from the speaker in meters

Example: With a **CL-8P-SUB** with 84dB sensitivity, driven by a 80W amplifier, the sound pressure level 3 meters from the speaker will be:

$$\mathbf{SPL_{3m} = 84 + 10 \cdot \log_{10}(80) - 20 \cdot \log_{10}(3) = 93.5\ dB\ SPL}$$

Technical Specifications

Model	CL-8P-SUB
Audio Specifications	
Drivers	
LF Driver	200 mm (8 in) high output driver with polypropylene cone and rubber surround
Frequency Characteristics	
Frequency Range (-10dB)	45Hz-570Hz
Frequency Response (±3dB)	80Hz-500Hz
Power Handling	
Power Handling	80W continues / 120W peak
Impedance	8Ω
Multi tap transformer settings	70V: 80W / 40W / 20W / 10W 100V: 80W / 40W / 20W
Acoustical parameters	
Sensitivity (1W@1m)	84dB
Maximum continuous SPL (dB) @1m	Continuous: 103dB SPL / Peak: 105dB SPL
Dispersion	Omnidirectional
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	8.05kg (17.75lbs)
Dimensions	
Depth (ceiling clearance)	315mm / 12.4”
Back enclosure outer diameter	295mm / 11.6”
Cutout diameter	297mm / 11.7”
Grill diameter	327mm / 12.9”
Shipping	
Single box dimensions (single unit):	430mm x 430mm x 378mm / 17" x 17" x 15"
Master box dimensions (single unit)	438mm x 438mm x 391mm / 17.3" x 17.3" x 15.4"
Single Box weight	10.6KG / 23.4lbs
Master box weight	11.4KG / 25.2lbs
Packaging	Eco-friendly mono-material packaging made entirely from recyclable cartons, 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
CL-8P-SUB
SPL dB (@1m / 1W)
100
90
80
70
60
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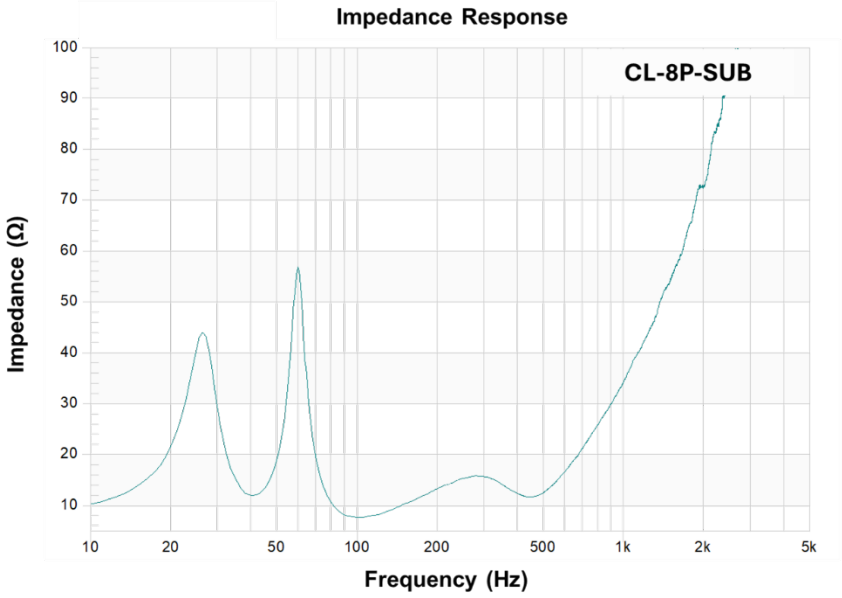
40
20
50
100
200
500
1k
2k
5k
10k
20k
Frequency (Hz)


Impedance Response
CL-8P-SUB
Impedance (Ω)
100
90
80
70
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30
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10
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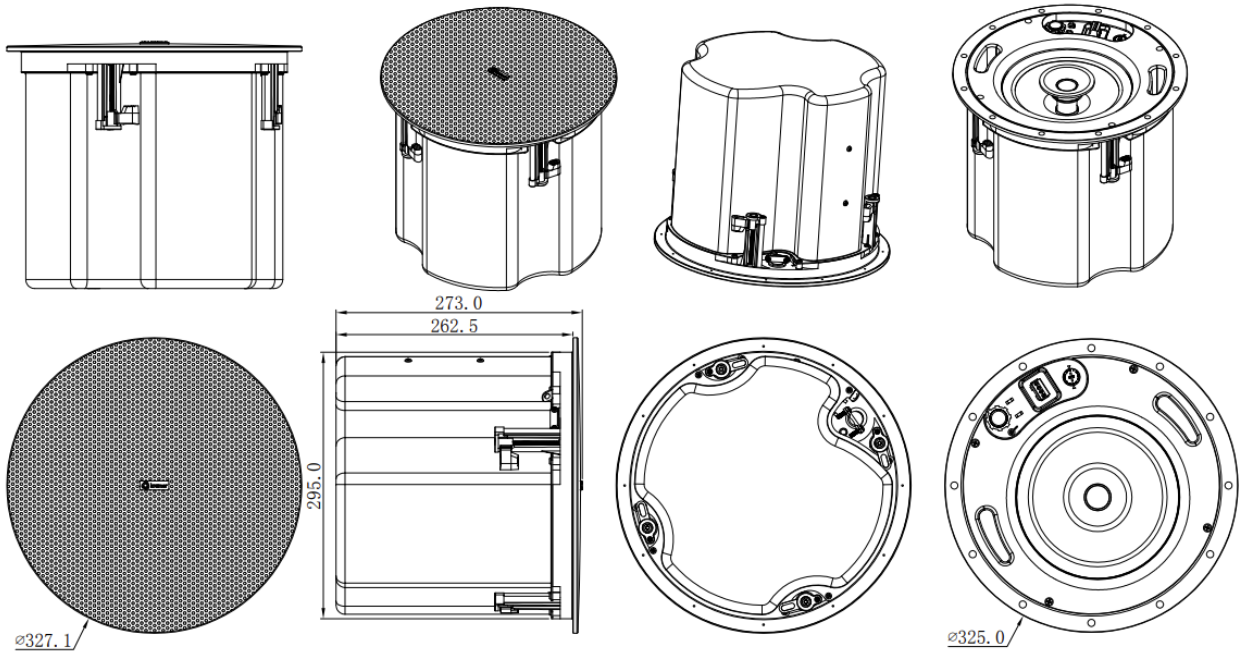
100
200
500
1k
2k
5k
Frequency (Hz)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For the latest information on our products and a list of Kramer distributors, visit our website where updates to this user manual may be found.

We welcome your questions, comments, and feedback

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