USER MANUAL

MODEL - PN-6P

Two-way Passive Pendant Speaker

Contents

Introduction

Thank you for purchasing the Kramer PN-6P Speaker. This high-quality pendant passive speaker delivers premium sound performance for commercial audio installations. Designed for both 8Ω and 70V/100V systems, it is ideal for background music, speech applications such as meeting rooms and auditoriums, paging, and distributed sound 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 to which the speaker is installed can support the weight of the speaker.
- For mounting the speaker, use the suspension cable that is provided with the speaker.
- 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

- PN-6P pendant speaker (single unit)
- Suspension cable systems including: 4.5m / 177" long 2mm / 0.08" diameter high–tensile galvanized–steel wire with spring–clip carabiner for clipping onto the loudspeaker bracket and a gripple fastener for adjusting speaker height
- 4-pin pluggable Euroblock connector, 28-12AWG
- Quick Start Manual

Overview

The PN-6P is a high-end 6.5” wall mounted passive speaker featuring exceptional sound, optimized for conferencing and background music.

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

The speaker is supplied with 4.5m / 177” suspension cable.

The speaker is available in both black & white colors.

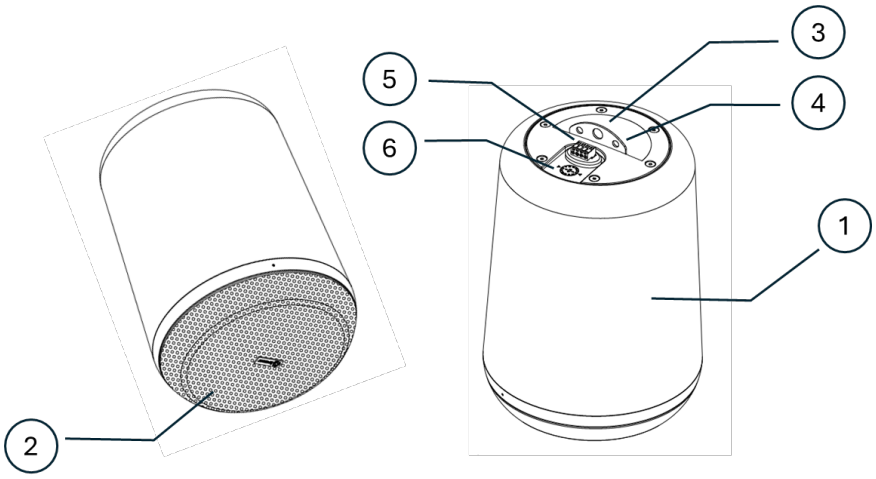


Figure 1: PN-6P Speaker

#	Feature	Function
1	Speaker	Speakers body
2	Speaker grill	Speaker’s grill
3	Mounting bracket	Connecting the suspension cable
4	Safety anchor point	Secondary safety anchor points for securing a seismic restraint cable
5	Terminal connector	4-pin pluggable Euroblock connector, 28-12AWG for connecting the speaker cables
6	Transformer tap selector	For selecting between 8Ω low-impedance modes and 70V/100V high-impedance modes

Key features

- Exceptional sound performance
- Low-impedance (8Ω) / high-impedance (70V/100V)
- Power handling: 30W continuous / 45W peak
- Sensitivity (1W@1m, free field): 90dB SPL
- Maximum SPL (@1m): Continuous 105dB SPL / Peak 107dB SPL
- UL1480A certified
- Eco-friendly mono-material packaging

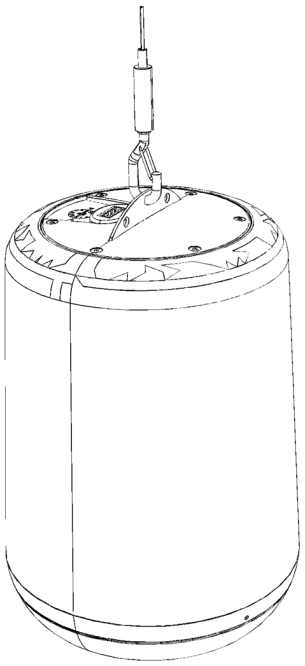
Models

Model	Part Number	Description
PN-6P (W) (SINGLE)	60-000113	6.5” Two-way Passive Pendant Speaker, white
PN-6P (B) (SINGLE)	60-000114	6.5” Two-way Passive Pendant Speaker, Black

Typical Applications

PN-6P is ideal for the following typical applications:

- Open ceiling applications such as Gyms, restaurants, airports, offices



Installation Guide

Unpacking

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

Achieving Best Performance

To achieve the best performance:

- Use only good quality speaker cables (we recommend Kramer high-performance, BC-2S cables and for plenum installations we recommend the low smoke halogen free 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 the location of the speakers based on the designated listening area, the height of the ceiling and dispersion angle of the speakers. Ensure the ceiling is appropriate for mounting the speaker's weight.
- Obstruction Check: Verify the mounting location is free of obstructions like electrical piping, AC ducts, or water lines.
- Ceiling Clearance: Avoid placing speakers too close to the ceiling to prevent sound distortion.
- Avoid Reflective Surfaces: Minimize placement near glass, tiles, or other reflective materials to reduce unwanted echo or reverb.

Mounting the Speaker

- **Step 1: Install Suspension Hook** (Not Supplied) - Install a strong, secure ceiling-mounted hook or anchor point suitable for the ceiling material.
- **Step 2: Attach Suspension Cable** - Use the included suspension cable to hang the speaker from the ceiling hook. Connect the cable to the speaker's mounting bracket.
- **Step 3: Adjust Hanging Height** - Use the built-in cable length adjustment mechanism to set the speaker to the desired height.
- **Step 4: Connect Speaker Wires -** Connect the speaker cable to the supplied terminal block. Match the correct polarity and configure the speaker for 8Ω or 70V/100V operation, as required.
- **Step 5: Final Check and Test -** Verify all mechanical and electrical connections are secure. Power up the system and test for proper audio performance and coverage.

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 **PN-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 **PN-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 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)

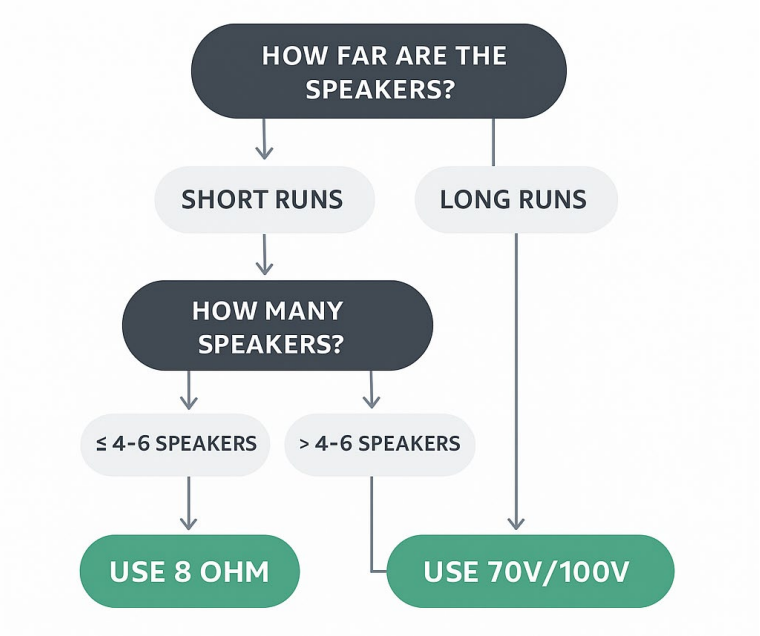
In low-impedance systems, long runs require very thick cables to avoid losses. High-impedance systems reduce current, allowing the use of thinner and longer cables.

- **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%):

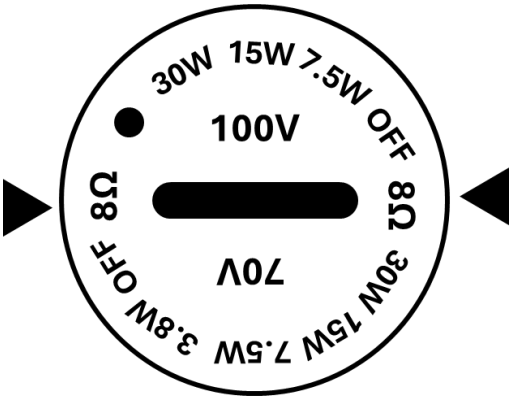
Total Load / Cable Gauge	30W	90W	150W	300W
16 AWG (1.31mm²)	180m / 590ft	60m / 200ft	36m / 118ft	18m / 60ft
14 AWG (2.08mm²)	290m / 950ft	96m / 315ft	58m / 190ft	29m / 95ft
12 AWG (3.31mm²)	460m / 1500ft	153m / 500ft	92m / 300ft	46m / 150ft
10 AWG (5.26mm²)	730m / 2400ft	243m / 795ft	146m / 480ft	73m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

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

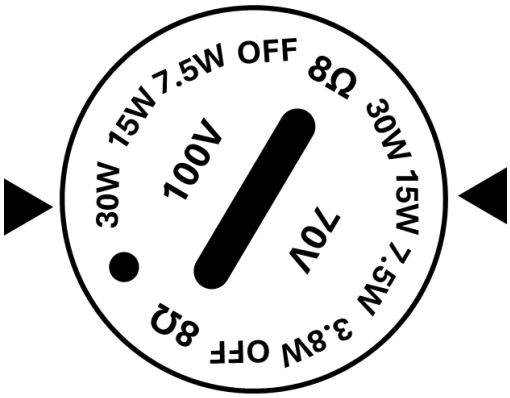
Setting up speaker power handling mode

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 will be 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

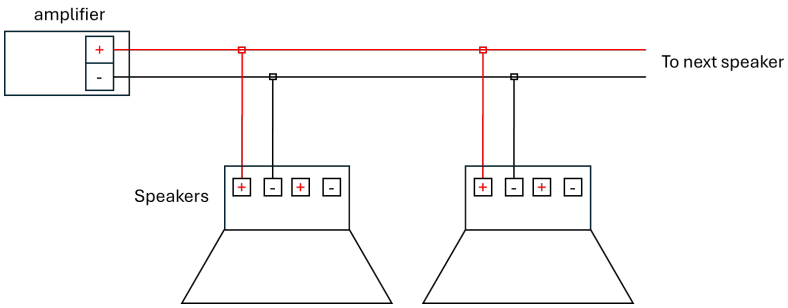


Figure 2 - Parallel Wiring

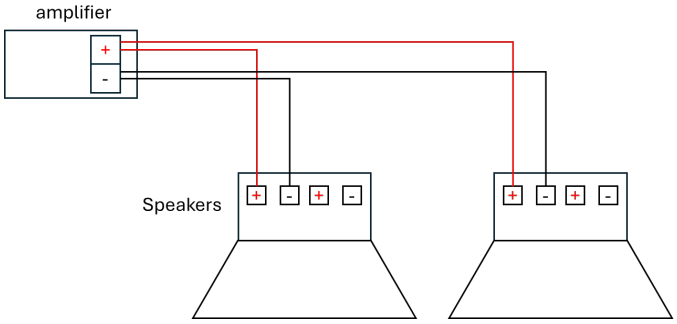


Figure 3 -Parallel Wiring - Separate Cables

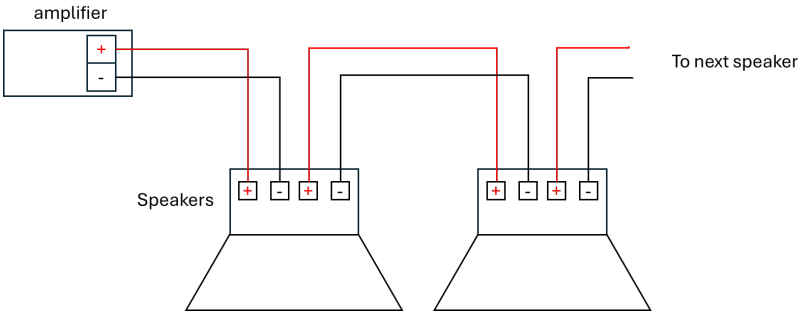


Figure 4 - Daisy Chain Wiring

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	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

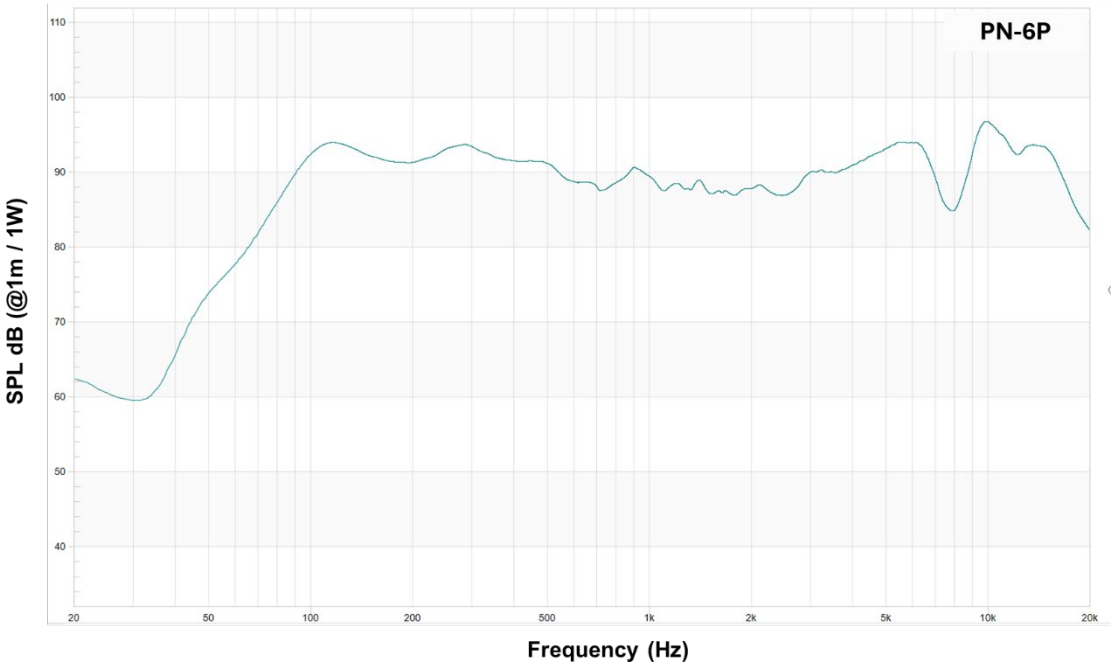
Example: With a **PN-6P** with 90dB sensitivity, driven by a 30W amplifier, the sound pressure level 3 meters from the speaker will be:

$$\mathbf{SPL_{3m} = 90 + 10 \cdot \log_{10}(30) - 20 \cdot \log_{10}(3) = 95\ dB\ SPL}$$

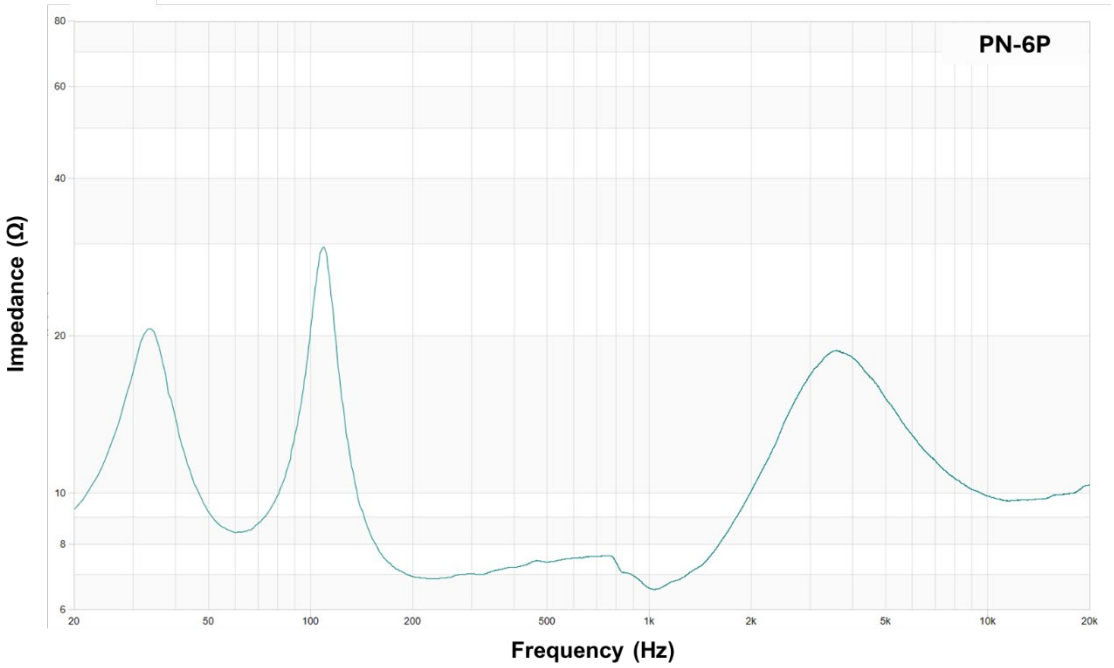
Technical Specifications

Model	PN-6P
Audio Specifications	
Drivers	
LF Driver	165 mm (6.5”) with polypropylene cone, butyl rubber surround, copper-clad coil, vented aluminum former
HF Driver	19 mm (0.75”) black silk dome with dampening, ferrofluid- cooled
Frequency Characteristics	
Frequency Range (-10dB)	68Hz-20kHz
Frequency Response (±3dB)	87Hz-18kHz
Power Handling	
Power Handling	30W RMS 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)	90dB
Maximum continuous SPL (dB) @1m	Continuous: 105dB SPL / Peak: 107dB SPL
Dispersion	108° conical dispersion (1 kHz to 4 kHz)
Mechanical specifications	
Installation	
Type	Pendant Ceiling Speaker
Mounting	Suspension cable systems including: 4.5m / 177” long 2mm / 0.08” diameter high–tensile galvanized–steel wire with spring–clip carabiner for clipping onto the loudspeaker bracket and a gripple fastener for adjusting speaker height. Cable have SWL rating of 45 kg / 100lbs
Connectors	4–pin pluggable Euroblock connector, 28–12AWG
Weight per single speaker	3kg (6.6lbs)
Dimensions	
Height (w/o mounting bracket)	312mm / 12.3”
Height (including mounting bracket)	333mm / 13.1”
Speaker outer diameter	224mm / 8.82”
Minimum distance between the grill and the ceiling	380mm / 15”
Shipping	
Packaging	Packed as a single speaker per box. 2 single speaker boxes packed in a master box
Packaging Materials	Eco-friendly mono-material packaging made entirely from recyclable carton, designed for durability and ease of recycling
Shipping Dimensions (2 single boxes in a master box)	572mm x 312mm x 398mm / 22.52” x 12.33” x 15.67”
Shipping Weight (Master Box)	TBD
Materials	
Grill	Powder Coated Steel, removable logo
Baffle	ABS765A Flame Retardant
Back Enclosure	ABS765A Flame Retardant
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, CE, UKCA
Environmental	RoHS, REACH, WEEE

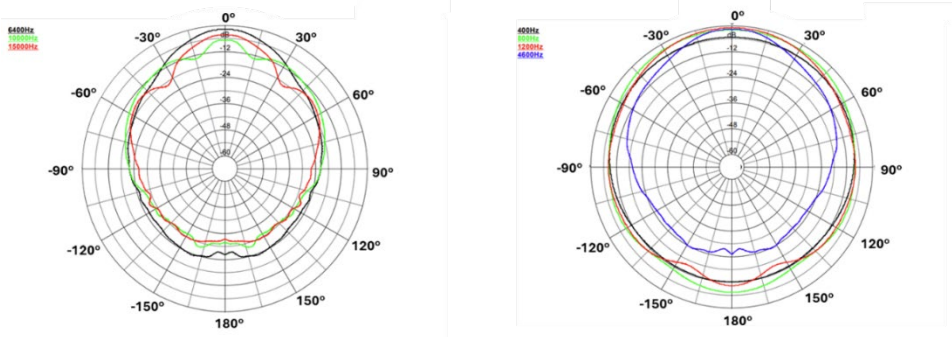
Frequency Response

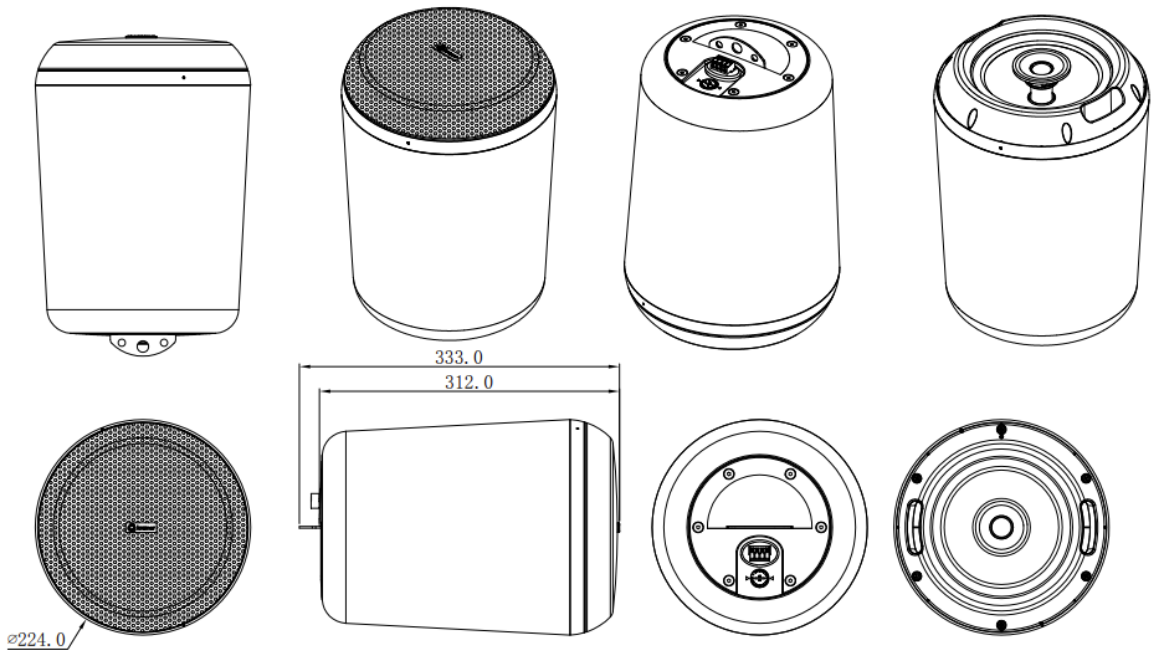


Impedance Response



PN-6P - Polar Graphs

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