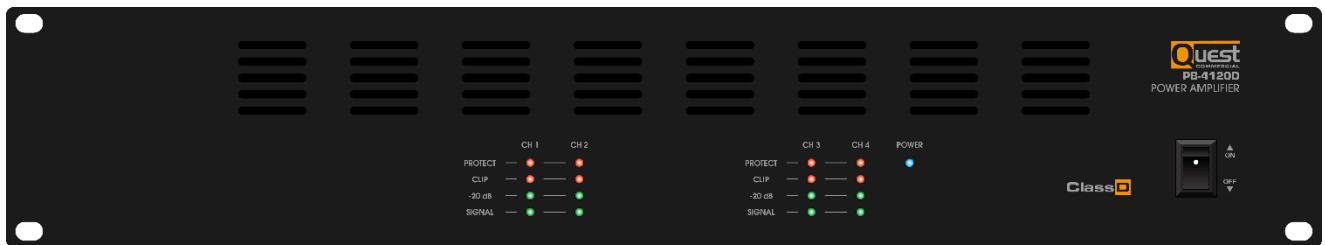


# User's Manual

## POWER AMPLIFIER



MODEL:

PB-4120D / PB-4300D



*Specifications are subject to change without notice*

## IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions - All the safety and operating instructions should be read before this product is operated.
2. Keep these instructions – The safety and operating instructions should be retained for future reference.
3. Heed all warnings – All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow all instructions – All operating and use instructions should be followed.
5. Do not use this apparatus near water – The appliance should not be used near water or moisture – for example, in a wet basement or near a swimming pool, and the like.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produces heat, without proper ventilation.
9. Do not defeat the safety purpose of the polarized, or grounding plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug doesn't fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and at the point where they exit from the apparatus
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when
  - The apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
  - Please keep the unit in a good ventilation environment.
  16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall not be placed on apparatus.
  17. **WARNING:** The mains plug, or appliance inlet is used as disconnect device, the disconnect device shall remain readily operable.
  18. **Power Sources –** This product should be operated only from the type of power source indicated on the rating label. If you are not sure of the type of power supply to your home, consult your product dealer, or local power company. For products intended to operate from battery power, or other source, refer to the operating instructions.
  19. **Safety Check –** Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the products is in proper operating condition.
  20. Don't touch conductive parts of output terminals to prevent hazardous electrical shock. The external wiring connected to the terminals requires installation by an instructed person or the used of ready-made leads or cords.
  21. This equipment is for commercial and professional use only.
  22. This product is in compliance with EU WEEE regulations. Disposal of end-of-life product should not be treated as municipal waste. Please refer to your local regulations for instructions on proper disposal of this product. 
  23. To prevent hazardous electrical shock, do not touch the conductive parts of the output terminal. The external wiring connected to the terminals requires installation by a qualified technician or the use of ready-made leads or cords.
  24. Please locate the apparatus at places nearby power socket for quick power disconnection in case of emergency.



Protective earthing terminal. This apparatus should be connected to a mains socket outlet with a protective earthing connection.



This Lightning flash is intended to alert the user to the presence of non-insulated “dangerous voltage” on the output terminals that may be of sufficient magnitude to constitute a risk of electric shock. The external wiring connected to the terminals requires installation by an instructed person or the used of ready-made leads or cords.



**CAUTION:** To reduce the risk of electric shock, do not remove any cover. No user-serviceable parts inside. Refer servicing to qualified service personnel only.



The Lightning flash with arrowhead symbol within the equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying this appliance.

**CAUTION:** To prevent electric shock, do not use this polarized plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

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## Introductions



### Welcome

Thank you for purchasing the Quest Commercial PB-Series Amplifier.

These amplifiers have been designed as no-nonsense amplifiers with only the necessary controls and connections, which creates great simplicity in use and installation. A high efficiency and reliability of the devices is achieved by using switching power supplies in combination with Class-D Amplifier technology.

Both models are identical physically and in features. They differ only in the power output: 4 x 120W for the PB-4120D and 4 x 300W for the PB-4300D. The amplifiers can drive either low-impedance loudspeakers directly (4-8 ohms) or 70/100V line loudspeaker distribution system, each channel can be configured independently for 4-8 ohms or 70/100V operation, allowing for mixed use.

All connections are made on the rear panel, using detachable screw-terminal type connectors (Phoenix-compatible). Each channel has a preset level control and a switchable high-pass filter to mitigate the effect of transformer saturation at low frequencies when driving 70/100 V-line systems.

The front panel has a set of LEDs for each channel, confirming signal presence, excessive level and amplifier protection activity.

Both models are forced-air cooled by a fan mounted on the rear panel; airflow is front-to-rear.

With proper maintenance and sufficient ventilation, your product will give you satisfaction for many, many years. Record the serial number below for future reference:

Serial Number : \_\_\_\_\_

Date of Purchase : \_\_\_\_\_

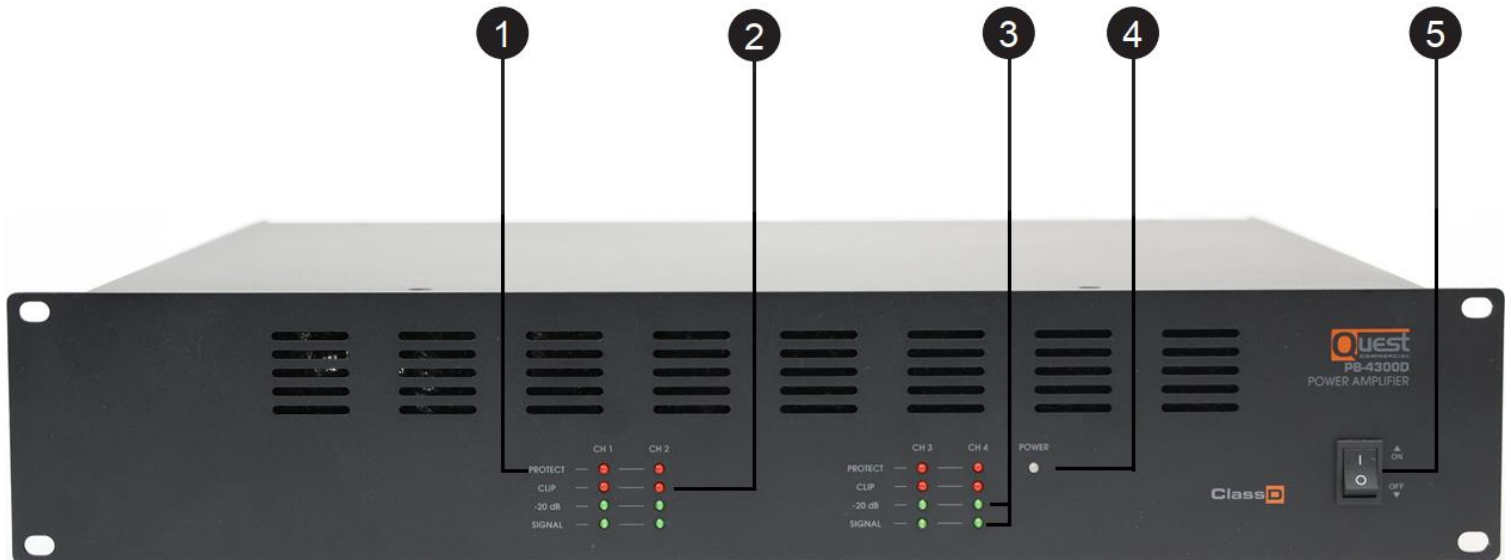
## Features

*The PB-4120D and PB-4300D power amplifiers are complete have been developed using the latest technology in Class D power amplifier design. Here are some of their main features:*

- The amplifiers deliver either 120W or 300W of clean power per channel at 70/100V and 4 Ohms
- Class D amplifier operating at 85% efficiency using switching power supplies. The PB-Series amplifiers generate virtually no heat, thanks to their low current draw.
- Built-in 70/100V output transformers with flat frequency response from 40Hz to 20kHz provide constant voltage for distributed speaker systems.
- Independent input level controls for each channel allow precise adjustments.
- Clean, crisp sound – Impressive audio specifications such as < 0.3% THD, dynamic range of 105 dB, crosstalk of > 70 dB, and frequency response of 50 Hz to 18 kHz guarantee ultra-clean sound quality.
- LED signal indicators for each channel continuously display power output levels and allow you to correct for overloading (clipping) conditions.
- Forced air cooling via internal fan provides reliable performance without thermal and overheating problems.
- Input connections for each channel are made using Euroblock connectors to accommodate both balanced and unbalanced signals sources.
- Output connections for each channel are made using Euroblock connectors which accept 12 gauge wire.
- CSA/UL approved.
- Class D & switching power supply
  - PB-4120D @ 120V / 5.8A
  - PB-4300D @ 120V / 13.9A
- The PB-Series amplifiers can be mounted in any standard 19" rack (taking just two rack spaces), making it easy to integrate into any fixed or traveling PA rig.
- Housed in a double rack space (2RU) 19" rack mounting housing.
- Three-year warranty.

## Controls

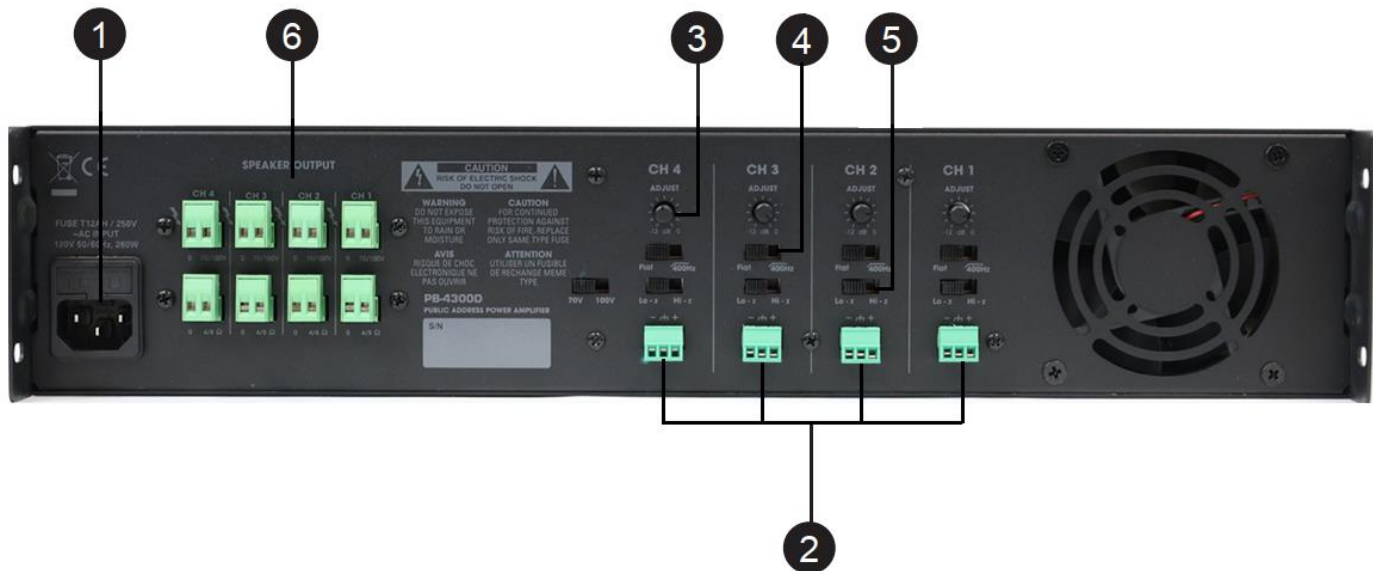
### FRONT PANEL



[Figure 1.1 Front panel layout]

1. **Protection LED** - This goes on for approximately one second, whenever the amplifier is powered on and then turns off. The Protection LED will also light when overheating or other severe problems occur. It is normal for the Protection LED to fade slowly when the amp is powered off. When lit, no signal is provided to any connected speakers, thus muting them and preventing any “thump” from occurring.
2. **Clip LED** - The CLIP segment lights whenever the channel is outputting signal at full strength. For the best signal-to-noise ratio, the right (CLIP) segment should light occasionally during peak levels; if it lights frequently, you may be overloading the amplifier, and a distorted (“clipped”) signal is most likely being produced.
3. **Signal LED** - The front panel LED indicators continuously monitor the power output level for the corresponding channel.
4. **Power LED** - The internal LED lights whenever the amplifier is powered on.
5. **Power switch** - Use this to power the amplifier on or off.

## REAR PANEL



[Figure 1.2 Rear panel diagram]

1. **AC input** - Connect the supplied heavy-gauge 3-pin “IEC” power cable here.
2. **Input connectors** - Connect incoming signals to these electronically balanced connectors. We recommend the use of balanced three-conductor cabling wherever possible (unbalanced two-conductor signals can also be inserted into these inputs, but you’ll get better signal quality and less outside noise and hum if you use balanced lines). The PB Series accepts input levels of any strength but needs at least 0 dBu to achieve maximum power.
3. **Channel input level controls** - These controls allow you to precisely adjust the input level of the signal arriving at the rear-panel input connectors. At their fully counterclockwise position, the signal is attenuated by -12 dB. At their fully clockwise position, the signal is at unity gain (that is, no attenuation). When 0dBu of signal arrives at the input jacks and the Channel input level controls are set to their fully clockwise position, the Amplifier delivers full power output.
4. **High Pass filter** - Enable an internal, per-channel high-pass filter, limiting the LF content of the signal in order to reduce the possibility of transformer core saturation.
5. **Output mode** – This controls the output mode of each channel independently; Low-z for 4-8 ohms speaker output, or Hi-z for 70/100V speaker output.
6. **Output connectors** - Use these to connect each channel of the amplifier to 4-ohm or 8-ohm loudspeakers on the bottom connectors, or to the 70/100V speaker line on the top connector.

# Setup

## Installation

**CAUTION:** Before you begin, make sure your mixer amplifier is unplugged from the power source, and the power switch is in the "OFF" position.

### **Location:**

Take the unit out of its packaging (keep it for any return to the workshop). The PB-Series amplifiers can be installed in a standard 19" equipment rack or on a shelf. To install the unit in a standard 19" equipment rack, please use the rackmount screw holes located on either side of the unit. Do not mount multiple units directly on top of each other, allow a 1U space between the units for convection cooling. If a table or shelf installation is the chosen route, be sure to choose a flat surface, with 12-inches (about 30cm) of air space around the unit for convection cooling, and that is free of liquids or other such hazards.

To select an appropriate location for your equipment, you must consider the distance between the amplifier and the speakers, the proximity of the sockets electrical, etc. You must determine the length of the cables used to connect your equipment to the speakers. Depending on the type of loudspeakers and the length of the cables, you can choose to route the signals to the loudspeakers in low impedance or in constant voltage.

If you are using low impedance speakers, you must connect them to one of the low impedance outputs (4/8 ohms) of the amplifier with speaker cables. However, pay attention to the diameter and length of the cables. If you are using loudspeakers with built-in 70V transformers, often referred to as constant voltage systems, please connect them to one of the high impedance (70V/100V) outputs. The advantage of these systems is that they allow the use of long cables to connect several loudspeakers to the same amplifier. The PB-Series amplifiers are ideal for this type of application as they are equipped with 70/100V output transformers.

### **Speaker selection**

When selecting loudspeakers, you must consider a few important factors, such as the location of the mixer amplifier, the type of loudspeakers and the need to use a 70V distribution system. The following sections explain how to connect loudspeakers or a constant voltage system in a typical installation.

#### **Using passive speakers**

Before using low impedance speakers (4 or 8 ohms), you must first determine the location of your mixer amplifier. If the speakers are less than 30 meters away, you can connect the amplifier directly to the speakers in low impedance mode.

Be sure to check the impedance of the speakers. The 4 Ohms output allows you to connect a 4 Ohms speaker or two 8 ohms speakers in parallel. If the speakers are more than 30 meters away (approximately), it is best to use a constant voltage system.



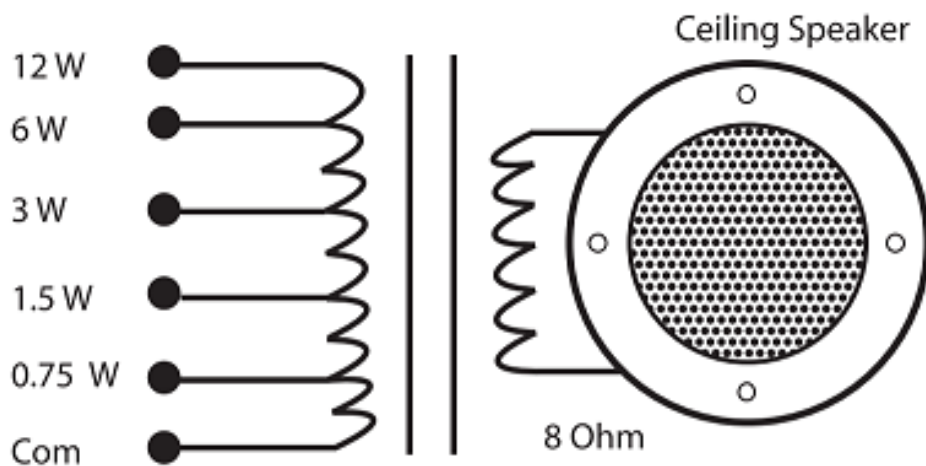
### Using a constant voltage system

If your setup has many loudspeakers and long cables, you might consider using a 70 or 100V constant voltage system. This type of system became standard in the field of installations in the middle of the 20th century because it offered an efficient solution for the use of multiple enclosures and long cables. It is inspired by long distance electrical networks which used increased voltage and reduced current to carry very high power over long distances with more affordable and relatively small diameter cables. The voltage is then reduced and then routed to the consumer on a short, large diameter cable.

The same principle applies to constant voltage audio systems. A transformer connected to the output of the amplifier increases the voltage and reduces the output current, allowing the use of long, smaller-diameter cables to link multiple speakers with step-down transformers. For economy, the 70V standard was adopted in the United States because electrical conduit is required on lines with voltages greater than 100V peak-to-peak. Commercial sound systems, such as those installed in schools, office buildings and restaurants, often use a constant voltage distribution system when multiple loudspeakers are connected in different areas.

Many loudspeakers with transformers are produced by various manufacturers. Most of these loudspeakers provide tap points on the transformer to allow power to be distributed to the loudspeakers and their levels to be adjusted separately. Quest Commercial amplifiers have a built-in transformer to step up the output voltage and step down the current so that multiple speakers (with transformers) can be connected using long cables. Constant tension systems allow the use of cables from 1 to 1.6 mm in diameter, depending on their length (long cables must be larger in diameter).

A simple way to represent a constant voltage is to divide the power in Watts of the amplifier by the number of loudspeakers used. For example, to connect ten loudspeakers to one of the output channels of a PB-4120D amplifier, use a loudspeaker whose transformer provides a tap point of 10 watts maximum. 120 Watts divided by 10 speakers gives 12 Watts per loudspeaker, but we must always keep a cushion of about 15 to 20% of the power of the amp to make sure not to overload the amp.



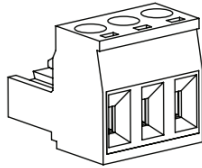
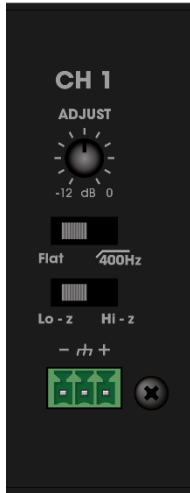
*Typical ceiling speaker with onboard transformer and six power taps. These power taps also control volume level for sound balancing.*

[Figure 2.1 Constant voltage speaker]

# Connections

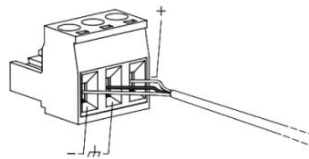
## Input Connections

The input connections of the amplifier are performed using balanced 3pin Euro block input. The input signal from the signal source, pre-amplifier or mixer should be connected to the input connectors.

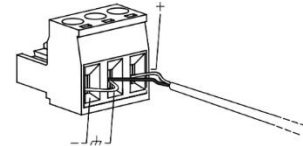


Left: Signal –  
Center: Ground  
Right: Signal +

Balanced Input Connection:



Unbalanced Input Connection:



[Figure 2.2 Input Connections]

## Output Connections

The loudspeaker output connections are performed using 2-pin terminal block connectors, making it possible to connect low impedance (4/8 Ω) or high impedance (70/100V) loudspeakers to the amplifier outputs. It is only possible to use one (either constant voltage 70/100V, or low impedance 4/8 ohms) of both options at a time.



Output voltage, impedance and maximum power load for each model.

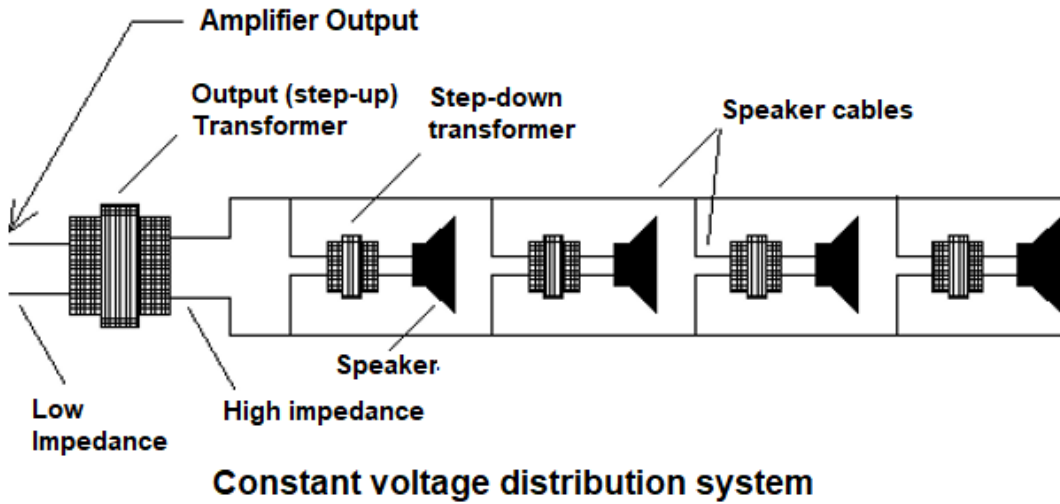
Model	Output voltage	Impedance	Power per channel
PB-4120D	70V	40.8 Ohm	120W
	100V	83.3 Ohm	
PB-4300D	70V	16.3 Ohm	300W
	100V	33.3 Ohm	

[Figure 2.3 Output Connections]

The 70/100 Volt speakers may be connected in parallel on the outputs of the amplifier unless the maximum load / impedance has been reached. The number of allowable loudspeakers depends on the tap setting of the step-down transformer of each of the connected loudspeaker

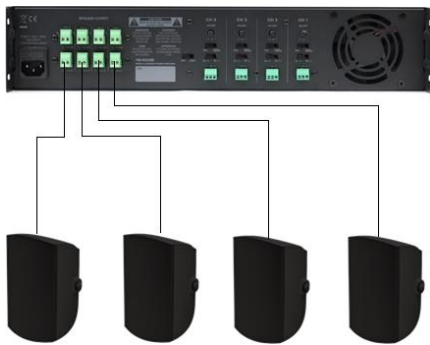
Never turn on the amplifier when the speakers are not connected to the outputs. When using the 4-8 Ohm output, you must connect speakers with a minimum impedance of 4 Ohms (4 Ohms or more).

For 70/100V operation, connect the speaker's positive input to the 70/100V terminal, and the negative input to the 0 (ground) terminal. Then connect the other speakers one after the other in parallel.

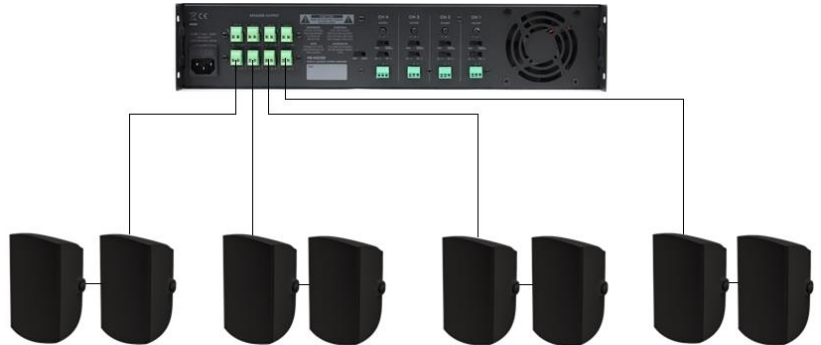


[Figure 2.4 Constant voltage speaker connection]

The following diagrams illustrate various wiring setups for 4/8 ohm and 70 Volt operation.



**8 Ohm Operation**  
(One 8 Ohm speaker per channel)



**4 Ohm Operation**  
(Two 8 Ohm speakers per channel)

[Figure 2.5 Connection example, 4/8 ohms operation]



**70 Volt Operation**

**(Four speakers per channel with their line transformer tap set to 25 watt – For PB-4120D)  
(Four speakers per channel with their line transformer tap set to 65 watt – For PB-4300D)**

[Figure 2.6 Connection example, 70/100V operation]

## Specifications:

Performance		
Model Number	PB-4120D	PB-4300D
Rated Power (1kHz, 1%THD+N )	120W x4 (70/100V)	300W x4 (70/100V)
	60W x4 (8Ω)	150W x4 (8Ω)
	120W x4 (4Ω)	300W x4 (4Ω)
Output Impedance	4Ω, 100V (83.3 Ω) or 70V (40.8 Ω)	4Ω, 100V (33.3 Ω) or 70V (16.3 Ω)
Input Sensitivity	1Vrms	
Input Impedance	10KΩ Balanced	
Frequency Response	50Hz - 18kHz	
Total Harmonic Distortion + Noise	< 0.3%	
Signal to Noise Ratio	> 90 dB	
Common Model rejection	70 dB	
Crosstalk	> 70 dB	
High-Pass filter switch	400 Hz	
Protection	DC-Short Circuit, Over Heating, Overload	
Cooling system	Temperature controlled fan	
Amplifier Technology	Class D	
Power supply	120V AC, 50/60Hz	
Weight (Net)	20.3 lb. (9.2 Kg)	21.4 lb3 (9.7 Kg)
Unit Dimension (W x H x D)	19 (W) x 14.75 (D) x 3.5 (H) inches 483 (W) x 375 (D) x 89 (H) mm	
Carton Dimensions (Width/Depth/Height)	21.5 (W) x 20.5 (D) x 6.75 (H) inches 546 (W) x 521 (D) x 172 (H) mm	
UPC Code	694970007802	694970007819







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