

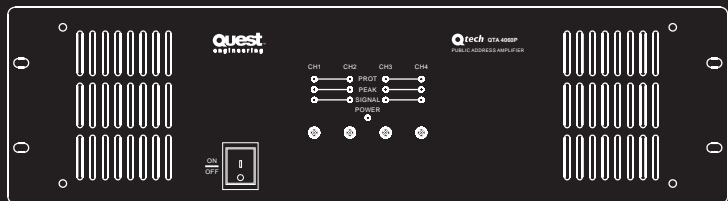
Q-Tech

Q-Tech Commercial Series

QTA-4060P/4120P

4 Channel Power Amplifiers

User Manual



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Safety Precautions

- Be sure to read the instructions in this section carefully before use.
- Make sure you observe the instructions in this manual as the conventions of safety symbols and messages are very important.
- We also recommend you keep this instruction manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of any risks.



WARNING

Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.



CAUTION

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.



WARNING

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Be sure to replace the unit's terminal cover after connection completion. Because high voltage is applied to the speaker terminals, never touch these terminals to avoid electric shock.
- Be sure to ground to the safety ground (earth) terminal to avoid electric shock. Never ground to a gas pipe as a catastrophic disaster may result.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down, causing personal injury and/or property damage.

When the Unit is in Use

- Should the following irregularity be found during use, immediately switch off the power, disconnect the power supply plug from the AC outlet and contact your nearest Quest dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
 - If you detect smoke or a strange smell coming from the unit.
 - If water or any metallic object gets into the unit
 - If the unit falls, or the unit case breaks
 - If the power supply cord is damaged (exposure of the core, disconnection, etc.)
 - If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to your nearest Quest dealer.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the ventilation slots of the unit's cover, as this may result in fire or electric shock.

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CAUTION

When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Do not block the ventilation slots in the unit's cover. Doing so may cause heat to build up inside the unit and result in fire.
- Avoid installing the unit in humid or dusty locations, in locations exposed to direct sunlight, near heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.

When the Unit is in Use

- Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.
- Make sure that the volume control is set to minimum position before power is switched on. Loud noise produced at high volume when power is switched on can impair hearing.
- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- Contact your dealer as to cleaning. If dust is allowed to accumulate in the unit over a long period of time, a fire or damage to the unit may result.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.



An all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.

General Description

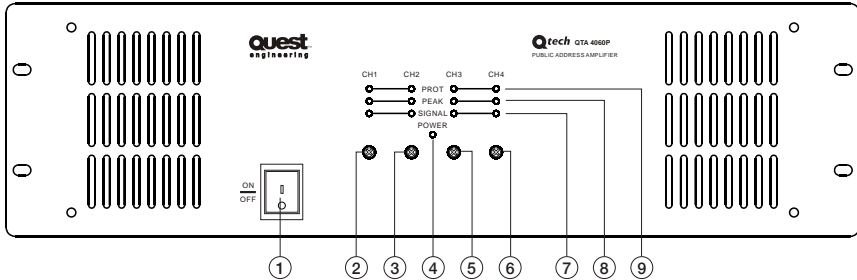
With four separate power amplifiers in a single chassis and power ratings from 60 to 120 watts RMS, these sleek, attractive units provide a compact solution for PA system amplification and distribution. Each channel has its own input and 4 ohm, 70V and 100V speaker outputs, so a wide variety of audio sources and speaker zones can be easily configured.

Features

- Rated outputs from 60W and 120W.
- 24V DC interface
- 100V/70V line transformer-isolated speaker outputs, low impedance 4 ohms speaker outputs.
- Four independent amps in a single chassis.
- Four line level inputs.
- Commercial-grade toroidal transformers produce high performance audio on a wide range of frequencies.
- An Intelligent limiter can reduce excess signal.
- Reliable protection against overload, short circuit, and power fluctuation for optimum reliability.
- Heat sinks and fan protect against overheating, protecting the amplifiers working life.
- Rubber feet and rack mount ears are supplied so the unit may be placed on tables or installed in rack mount cabinets.



Front Panel Layout



1. Power Switch

On top of the opening Power Press the end, power shut down

2. (CH1) Volume

Channel volume control

3. (CH2) Volume

Channel volume control

4. Power

Power indicator LED

5. (CH3) Volume

Channel volume control

6. (CH3) Volume

Channel volume control

7. Signal (CH1/CH2/CH3/CH4)

Signal indicator LED

When lit input signal is detected

8. Peak(CH1/CH2/CH3/CH4)

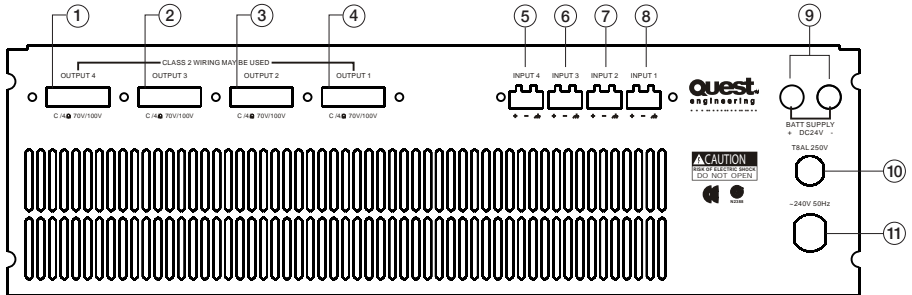
Peaking indicator LED

9. Protect (CH1/CH2/CH3/CH4)

Protection indicator LED When lit amplifier is in protection mode. Turn off amplifier, and check for short circuit in speaker wiring or excessive speaker load.

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Rear Panel Layout



1. Common Speaker Output 4

Connectors for 4 ohms or 70V and 100V speaker

2. Common Speaker Output 3

Connectors for 4 ohms or 70V and 100V speaker

3. Common Speaker Output 2

Connectors for 4 ohms or 70V and 100V speaker

4. Common Speaker Output 1

Connectors for 4 ohms or 70V and 100V speaker

5. Inputs 4

Channel volume control For wiring unbalanced inputs, tie (short) the (G) and (-) terminals together

6. Inputs 3

Channel volume control For wiring unbalanced inputs, tie (short) the (G) and (-) terminals together

7. Inputs 2

Channel volume control For wiring unbalanced inputs, tie (short) the (G) and (-) terminals together

8. Inputs 1

Channel volume control For wiring unbalanced inputs, tie (short) the (G) and (-) terminals together

9. 24V DC interface

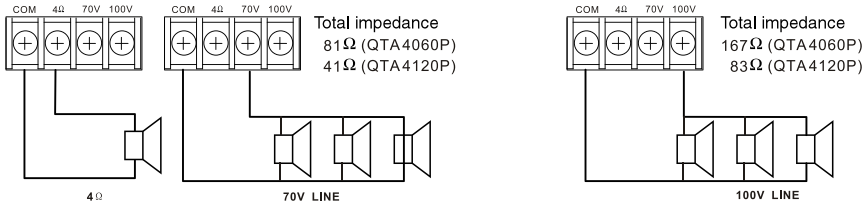
10. AC FUSE

11. ~240VAC POWER INPUT

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Connections

Speaker Connections



Notes:

- Both the 4Ω 70V/100V terminals cannot be used at the same time
- Impedances indicated in the figures represent the total speaker system (load) impedances



WARNING

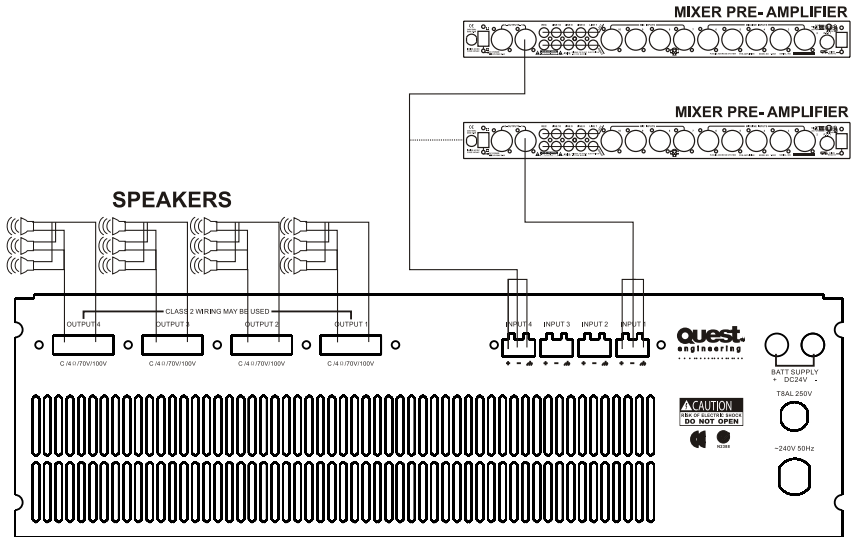
Be sure to attach the supplied terminal cover after connection completion. Because high voltage is applied to the speaker terminals, never touch these terminals to avoid electric shocks.

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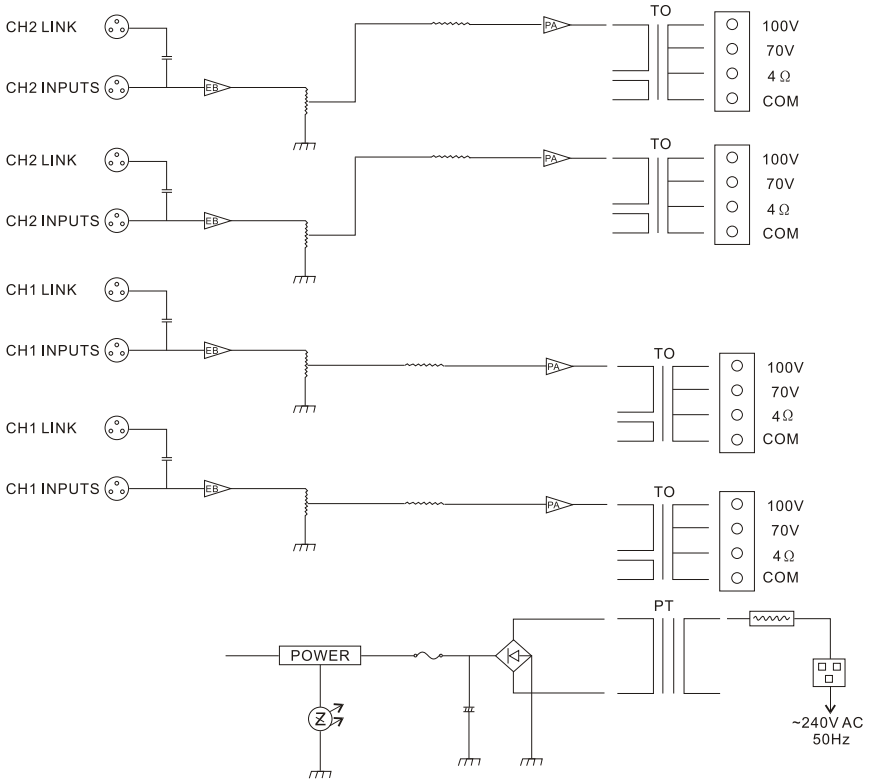
Applications

QTA-4060P/QTA 4120P Rear Panel Connections

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Block Diagram



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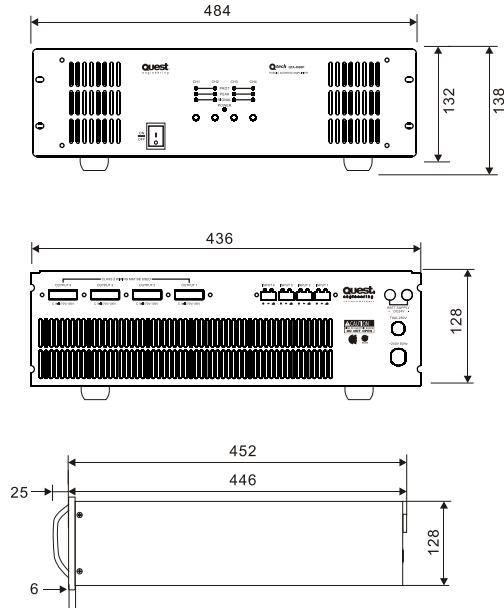
Specifications

Model	QTA4060P	QTA4120P
Rated Power Output	4X60W	4X120W
Speaker Outputs	4Ω,70V/100V	
Outputs Noise	<3mV	
Impedance	200:1	
Input Sensitivity	775mV/0dB	
Frequency Response	50Hz~16KHz distortion<1.5Db	
S/N Ratio	>15V/microsecond	
T.H.D	<1%	
Cool Method	Copulsive Wind Cool Form	
Indicators	Signal, Protection, Peaking	
Protection	Power on, Overload and Protection	
Power Requirements	~240V/Hz,24V DC (Optional)	
Power Consumption	360W	720W
Dimension (mm)	484X477X132	
Net Weight	23KG	26KG
Gross Weight	24KG	27KG

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Dimensional Diagram

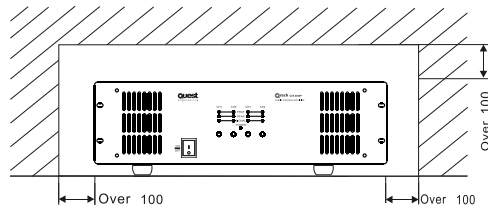
UNIT: mm



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Keep all the unit's sides over 10cm away from objects that may obstruct air flow to prevent the unit's internal temperature rising.

UNIT: mm



Technical Notes

Constant Voltage Distributed Speaker Systems Demystified

In a typical paging and background music speaker installation, quantity loudspeakers are placed across a single amplifier in a parallel wiring configuration (see Fig 1.).

Each ceiling speaker will contain a small transformer and you will notice that the connection block near the transformer will have a common terminal (C or earth), and a number of wattage terminals.

Connect the wattage setting terminal for the desired acoustic output (volume) level you need from each individual speaker.

This will be a 100V setting in Europe and most of Asia and 70V in the USA. (See the explanation below)

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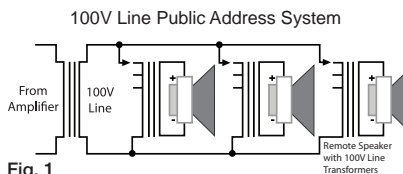


Fig. 1

Often some speakers need to be set at different volume output levels, and the calculations involved in determining the actual load impedance at the amplifier's output can be quite involved but there is a simple technique for not overloading the amplifier

As for the amplifiers, there are two common standards, 100 Volt line in Europe and Asia and 70 Volt line on the American continent.

For the purpose of simple calculations, we will use the European standard for this exercise.

On the rear of a 70/100V amplifier you will find an output terminal strip (see Fig 2). This terminal strip will contain a number of +

voltage outputs (70V 100V) and a terminal at one end for the negative return wire (COM).

A low impedance terminal will be for 8-ohm speaker installations and is under no circumstances to be connected to a transformer type speaker system.

Installation practice

Step 1. Take a piece of figure-8 cable, connect the stripe/coloured wire to the 100V terminal and the uncoloured wire to the COM on the amplifier terminal strip.

Step 2. Connect the other end of the wire (uncoloured) to the Com/EARTH connection on the ceiling speaker transformer and the other + (strip) wire to the required voltage tapping.

Step 3. Take a second piece of figure-8 cable and connect the plain wire to the parallel COM connection and the other + (stripe) wire to the parallel output from the transformer terminal block and connect it in the same way to the next ceiling speaker.

Step 4. Continue this process until all the ceiling speakers are connected in a parallel connection with all the COM connections and all the wattage connections following a parallel connection.

Common problems with ceiling speaker installations

System is distorting. Check for the following causes:

1. Too many speakers set to too high a power tapping for the power of the amplifier
Solution: Calculate the total power draw and re connect the speakers to a lower the wattage tapping. (See below)

Some cheap ceiling speakers have incorrect taping labels. A 10 watt speaker may really be drawing 15 or 20 watts. The only way to test this is with an impedance meter on a single speaker. A

15% discrepancy can mean that a 100 watt system will only be able to power 7 or 8 x10 watt speakers safely. Be aware of this booby trap. Always plan to have 20% more power than you think you will need.

2. Incorrect output connection: If you accidentally connect your terminal strip on the amplifier to the 8 ohm output instead of the 100/70V line, you will have distortion and risk damaging the amplifier..
3. Short circuits and no circuits: Check that your wiring has not been accidentally cut, miss-connected or generally damaged in the course of installation. This can be common with building sites with multiple trades people installing equipment into the same ceiling cavities as the audio system.

How to calculate the correct number of speakers and what wattage connection for a given amplifier power.

If you connect too many speakers to an amplifier you will have distortion, overheating of the amplifier and generally poor performance. The problem is not really “too many speakers”, it is more a problem of “too much wattage draw exceeding the output capability of an amplifier. A similar problem would be trying to draw 2,000 watts from a 1,000 watt generator. Sooner or later.... Expect a system failure.

Let us take a 100 watt amplifier. If you have 20 speakers and you set them at the 5 watt taping, you will have a total 100 watt draw which is the maximum output of the amplifier. This is correct in theory but in practice you will be safer connecting 18 speakers, not 20. The reason is that most ceiling speakers draw more than their claimed wattage.

The alternative would be to connect the speakers to the 4 watt transformer terminal giving you a theoretical total draw of 80 watts and thus, plenty of “headroom”. One watt difference is not very noticeable as far as output sound pressure level is concerned.

A system that does not distort will give much clearer voice reproduction than a louder system that is distorting or loosing the sibilant frequencies.

There is a formula for testing the potential power of the system by measuring the impedance of each speaker and then adding all the figures to a total impedance, which is then compared to the amplifier's expected impedance/power figures. The quick way is to just add up all the wattages and then give yourself 10-20% headroom by reducing the number of speakers per amplifier or lowering the wattages slightly.

For the benefit of those who want to calculate the power of the system with a formula. See below:

Determining power by calculating total impedance

The alternative to counting the speaker taping watts is to calculate the total impedance of the line, which will also indicate the wattage necessary to drive the system correctly.

The computational formula is voltage squared divided by impedance:

Power = Voltage² / Impedance.

When the speaker line reaches its top voltage of 70 Volts, the formula is:

Power = 5000 / Impedance (because 70 squared equals 5000).

To measure impedance a dedicated meter is required. These use a 1k frequency to send an alternating current through the transformer(s). The resulting figure indicated by the meter's dial can be cross referenced with the meter's impedance chart to see what value should be expected and the power that will be required.

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High impedance of speakers and output calculation table for 100Volt systems

Output	Impedance	Output	Impedance	Output	Impedance
0.1W	100K Ω	10W	1K Ω	40W	250 Ω
0.5W	20K Ω	15W	667 Ω	50W	200 Ω
1W	10K Ω	20W	500 Ω	75W	133 Ω
2W	5K Ω	25W	400 Ω	100W	100 Ω
3W	3.33K Ω	30W	333 Ω	150W	66.7 Ω
5W	2K Ω	35W	286 Ω	200W	50 Ω

(100V plan) $P = E \times E / Z = 100 \times 100 / Z = 10,000 / Z$

P: Power(W), Z: Impedance (Ω), E: 100V(Designed voltage of a general-use amplifier)





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