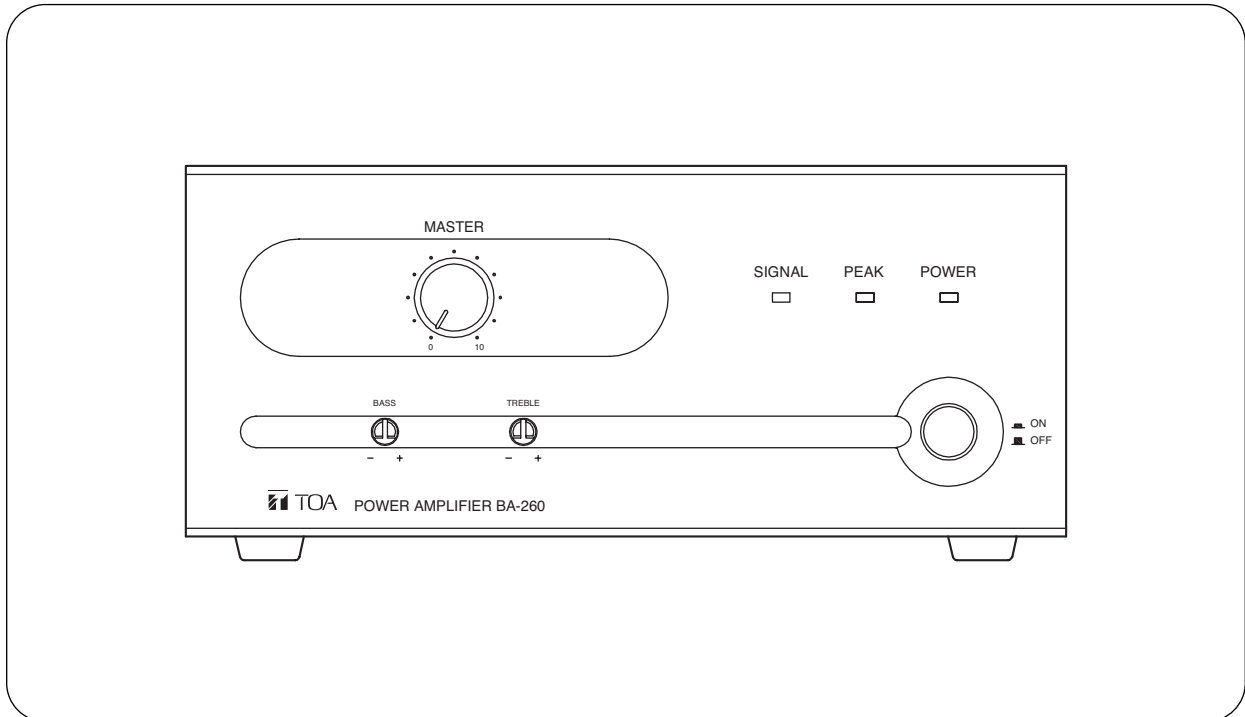


POWER AMPLIFIERS
**BA-235
BA-260**

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Thank you for purchasing TOA's Power Amplifiers.

Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

1. IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- 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.



- Unplug this apparatus during lightning storms or when unused for long periods of time.
- 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.

2. SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages 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 the potential safety hazards.



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



WARNING

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

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.
- 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 and causing personal injury and/or property damage.
- External wiring connected to the terminals marked with ⚡ requires installation by an instructed person.
- The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
- The socket-outlet shall be installed near the equipment and the plug (disconnecting device) shall be easily accessible.
- Use the optional Rack mounting bracket MB-25B-BK or MB-25B-J when mounting the unit(s) in an equipment rack. Remove four M4 x 8 screws on both sides of the unit, and mount the bracket there using the M4 x 16 screws (supplied with the bracket) instead.

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 TOA 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 TOA 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.

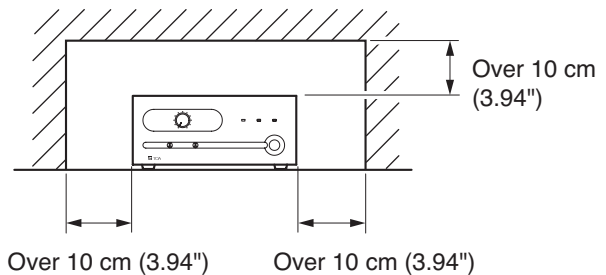


CAUTION

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

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 the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- To avoid electric shocks, be sure to unplug the unit's power supply cord when connecting speakers.
- Be sure to follow the instructions below when rack-mounting the unit. Failure to do so may cause a fire or personal injury.
 - Install the equipment rack on a stable, hard floor. Fix it with anchor bolts or take other arrangements to prevent it from falling down.
 - When connecting the unit's power cord to an AC outlet, use the AC outlet with current capacity allowable to the unit.
 - No rack-mounting screws are supplied with the unit. Separately prepare the appropriate screws for the rack.
- Keep the amplifier over 10 cm (3.94") away from objects that may obstruct air flow to prevent the unit's internal temperature rise.



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.
- 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.



The lightning flash with arrowhead symbol, within an 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 to persons.



ATTENTION

L'appareil ne doit pas être exposé aux éclaboussures ou écoulements et tous objets remplis de liquide, tels que vases, ne doivent pas être sur l'appareil.

3. GENERAL DESCRIPTION

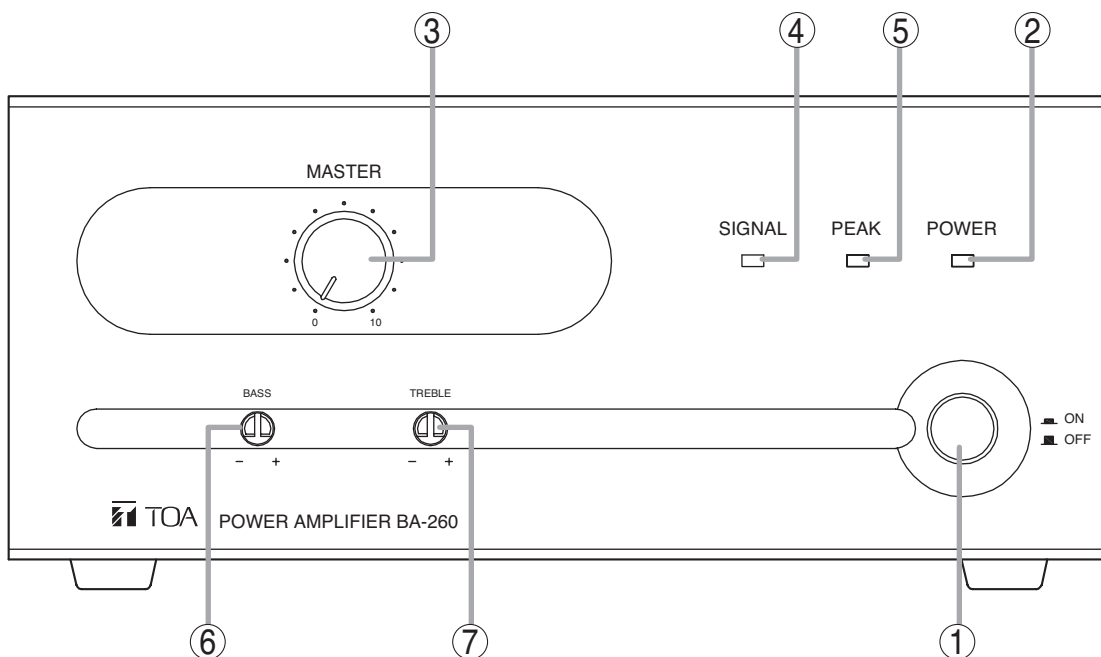
The BA-235 (35 W) and BA-260 (60 W) are Power Amplifiers for background music and general announcement. These units are suited for use in bars, retail stores, and banquet rooms. When used in conjunction with the optional mixer amplifier BG-220 (20 W) or BG-235 (35 W), 2-channel broadcast can be made.

4. FEATURES

- Remote master volume control using an external volume control.
- Supplied volume control cover prevents accidental operation of the Master volume knob.
- Front operable bass and treble controls.
Also front panel recessed knobs help to prevent accidental operation.
- Removable input/output terminal blocks facilitate installation and maintenance.
Besides, RCA jacks provided for LINE input.

5. NOMENCLATURE AND FUNCTIONS

[Front]



This figure represents the BA-260.

1. Power switch

Power is switched on and off with each depression of this switch.

2. Power indicator

Lights blue when the Power switch (1) is switched on.

3. Master volume control

Adjusts the gain of the Line input.
Turn the knob clockwise to increase the level and counterclockwise to decrease it.

4. Signal level indicator

Lights green when audio signals are output from the speaker output terminal.

5. Peak indicator

Lights red if output signals approach clipping level.
If steady lit, turn down the Master volume control until the indicator flashes intermittently.

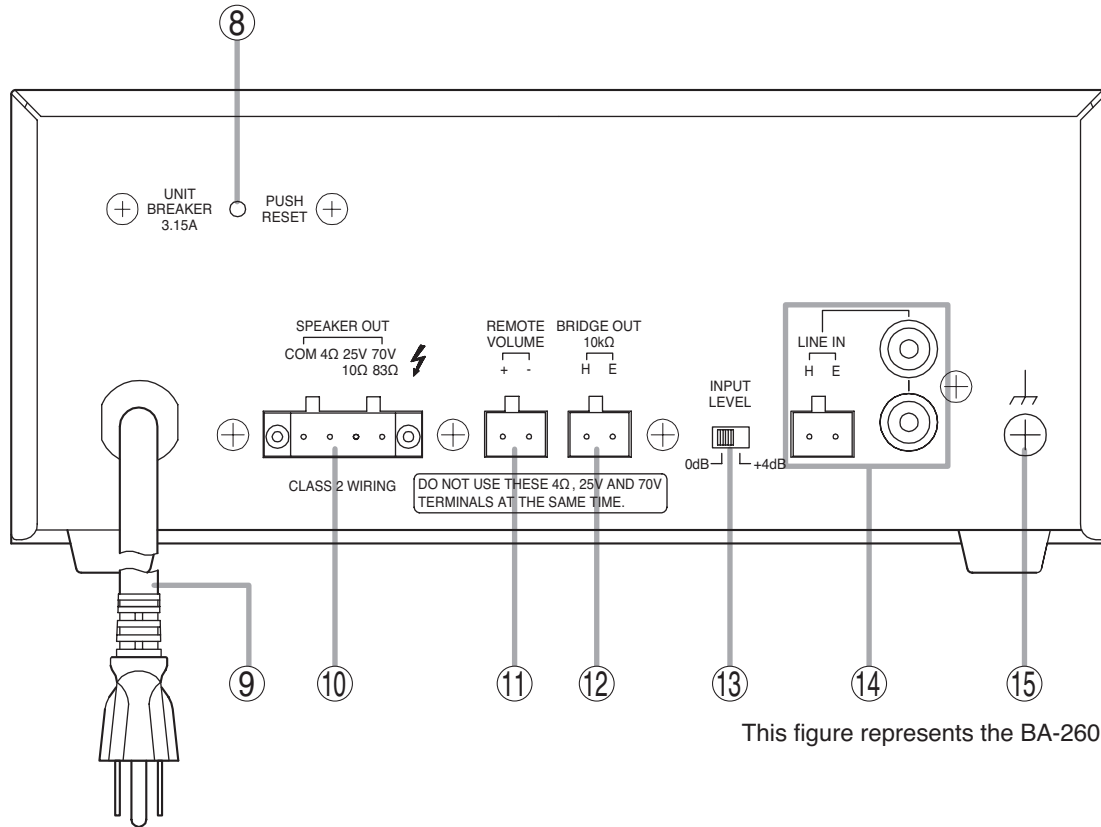
6. Bass control

Turn the control clockwise to increase bass level and counterclockwise to decrease it.
The center position of the control provides flat frequency response.

7. Treble control

Turn the control clockwise to increase treble level and counterclockwise to decrease it.
The center position of the control provides flat frequency response.

[Rear]



This figure represents the BA-260.

8. Breaker

Cuts off the AC power supply from the AC outlet if the power current exceeds the allowable value.

Note

The yellow button in the breaker pops out to indicate that the breaker has tripped. After turning off the power and eliminating the cause of the breaker trip, press the button to reset the breaker.

9. AC power cord

Connect to an AC wall outlet.

10. Speaker output terminal

4 Ω, 25 V and 70 V outputs, removable terminal block.

Connects to speakers.

Refer to p. 7.

11. Remote volume terminal

Removable terminal block.

Connecting a 10 kΩ linear taper volume control across these terminals will allow remote control of speaker output level.

12. Bridge output terminal

Removable terminal block.

This connector is internally connected in parallel to the Line input connectors (14).

Connect to the other amplifier's input.

13. Input level selector switch

Selects either 0 dB or +4 dB for the line input sensitivity level.

14. Line input terminals

10 kΩ, 0 dB*/+4 dB* selectable (see item 13), unbalanced, removable terminal block and RCA jacks (Upper and lower RCA jacks are internally, passively mixed.) (* 0 dB = 1 V)

These connectors are internally connected in parallel to the Bridge output connector (12).

Connect to the MOH output or Line output of the optional BG-220 or BG-235, or the Line output of a sound source equipment such as a CD player.

15. Functional ground terminal

Hum noise may be generated when external equipment is connected to the unit. Connecting this terminal to the functional ground may reduce the hum noise.

Note: This terminal is not for protective earth.

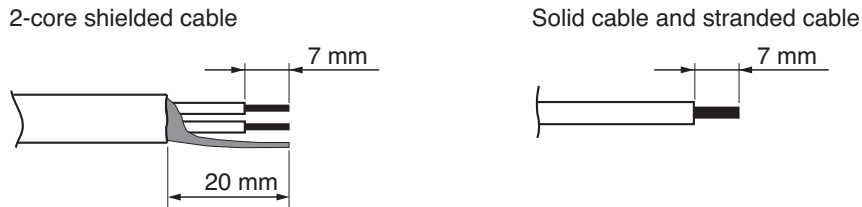
6. CONNECTIONS

6.1. Removable Terminal Plug Connection

Notes

- Avoid soldering cable conductor, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.
- Use cables of AWG 12 – 24.

[Cable end treatment]



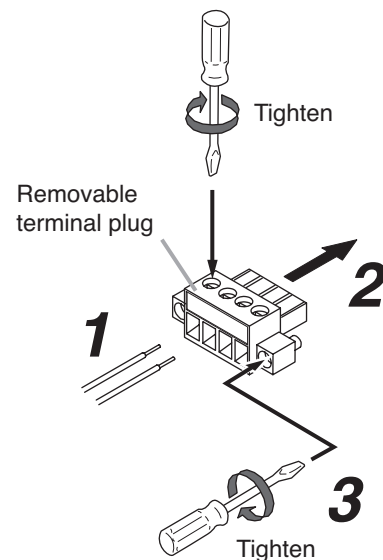
[Wiring Procedure]

Step 1. Wiring the supplied removable terminal plug.

- 1-1. Loosen the terminal screws to insert the wire.
- 1-2. Tighten the terminal screws.
Ensure that the wire does not break free when pulled. If the wire does pull free, repeat the connection procedure from the start.

Step 2. Insert the wired terminal plug into the corresponding terminal block in the unit's rear panel.

Step 3. Tighten the fixing screws. (Speaker output terminals only)

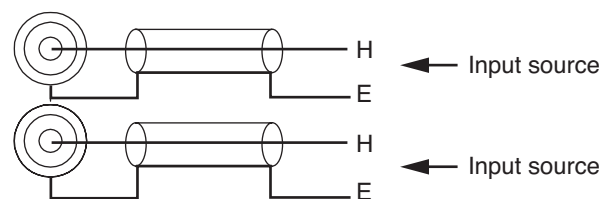
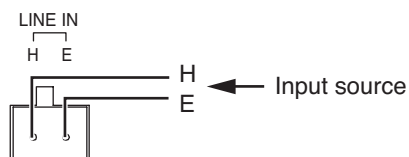


Notes

- Do not reverse **Steps 1** and **2**. Poor contact may result if force is applied to the unit's internal circuit board pins while the terminal screws are being tightened.
- Use an appropriate type screwdriver for terminal plug wiring.

6.2. Input Connections

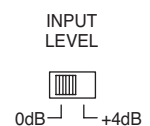
6.2.1. Line input connections



Upper and lower RCA jacks are internally, passively mixed.

[Input level selection]

Input sensitivity can be switched to either 0 dB or +4 dB depending on the output level of the input equipment.

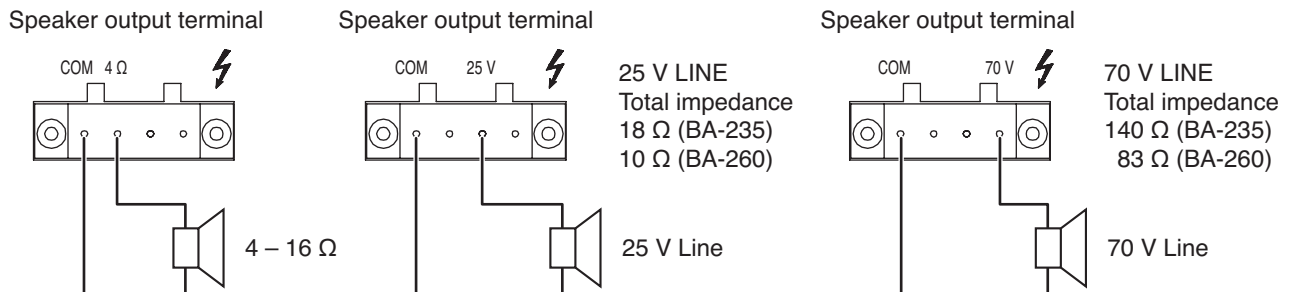


6.3. Output Connections

6.3.1. Speaker connections

Each amplifier has 3 speaker outputs: 4 Ω, 25 V, and 70 V. Use only one of these outputs for connection. Class 2 wiring may be used.

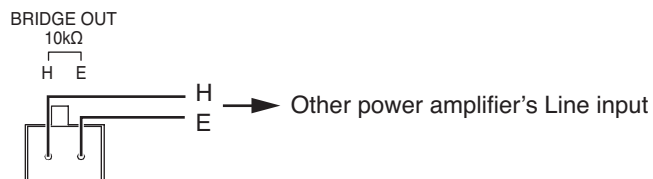
Note: Impedances in the figures below represent total speaker load impedance.



WARNING

The terminals marked with the symbol ⚡ are hazardous live. The external wiring to these terminals requires installation by an instructed person.

6.3.2. Bridge output connection

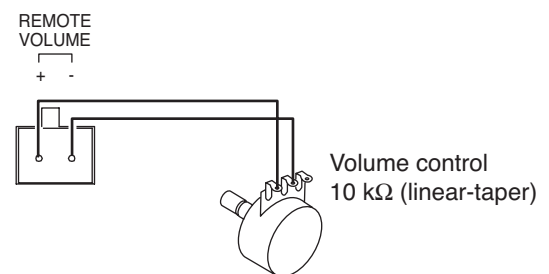


7. REMOTE VOLUME CONTROL CONNECTION

The external volume control can remotely adjust the signal level at post-master volume control. When performing the remote volume control, adjust the master volume control in advance noting that its setting limits the maximum signal level adjustable with the volume control. Be sure to avoid turning fully down the master volume control.

Notes

- Negative terminal should not be grounded. Never connect it to the unit's chassis nor other circuit ground.
- Only a volume control can be connected to these terminals.

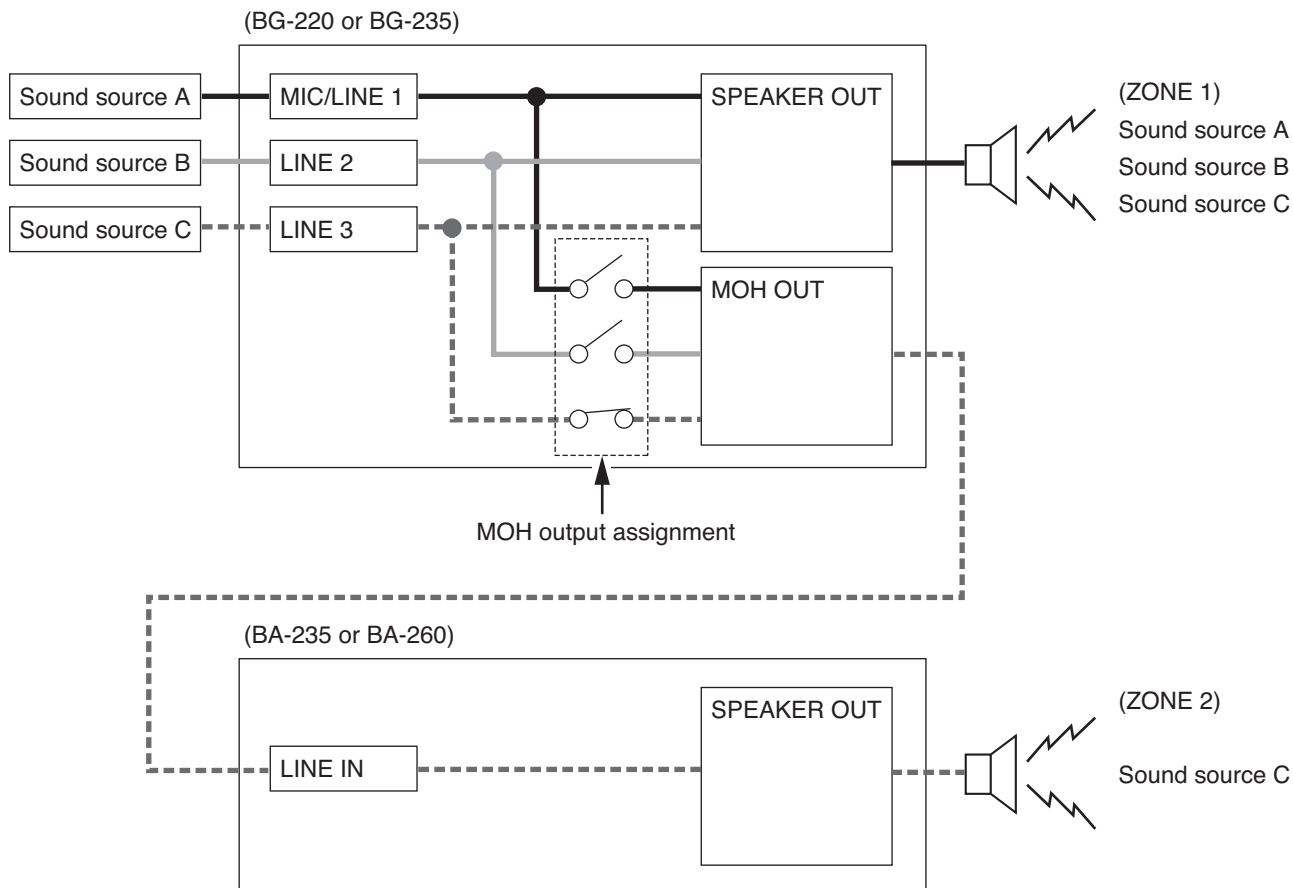


8. 2-CHANNEL BROADCAST

Each individual input of the optional BG-220 (20 W) and BG-235 (35 W) can be output to the MOH output. 2-channel broadcast can be performed by connecting the MOH output to the unit's LINE input.

(Example)

When MIC/LINE 1, LINE 2, and LINE 3 input signals are output to the Zone 1, and LINE 3 input signals to the Zone 2.



9. OPERATION

After completing all connections, turn on the power switch, and check to confirm that the power indicator lights.

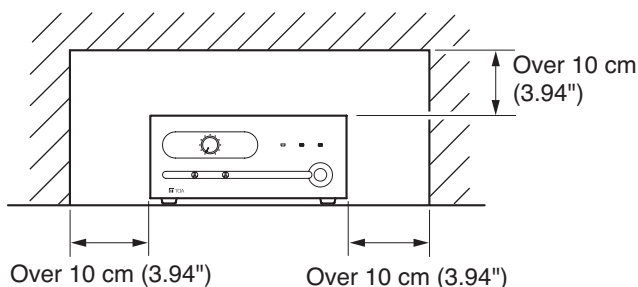
Note

When the heat sink temperature exceeds 105 °C (221 °F), the protection circuit begins to operate to disconnect the output from the circuit. The disconnected output is automatically restored as soon as the temperature returns to the normal operating range.

10. INSTALLATION PRECAUTIONS

CAUTION

Keep the amplifier over 10 cm (3.94") away from objects that may obstruct air flow to prevent the unit's internal temperature rise.



11. RACK MOUNTING BRACKET ATTACHMENT

To mount the BA-235 (BA-260) in a standard 19" equipment rack, use the optional MB-25B-BK or MB-25B-J Rack Mounting Kit.

Before attaching the rack mounting bracket, remove each 2 frontmost screws on both sides of the unit. These removed screws are not used for rack mounting.

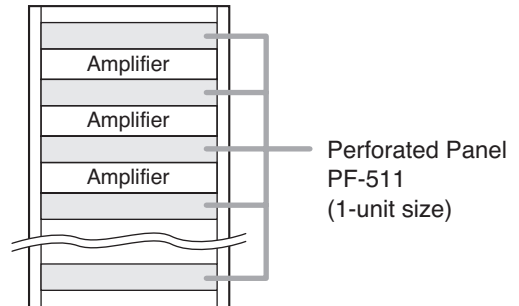
Notes

- Rack mounting screws are not supplied with the unit. Use the screws that are appropriate for the rack.
- When mounting the unit in an equipment rack, the inside of the rack must be sufficiently ventilated.

To achieve sufficient ventilation, also mount the optional PF-511 Perforated Panel (1U*):

- (1) at the top and the bottom of the rack, and
- (2) above and below the unit.

* 1U size = 44.5 mm or 1.75" (reference size)

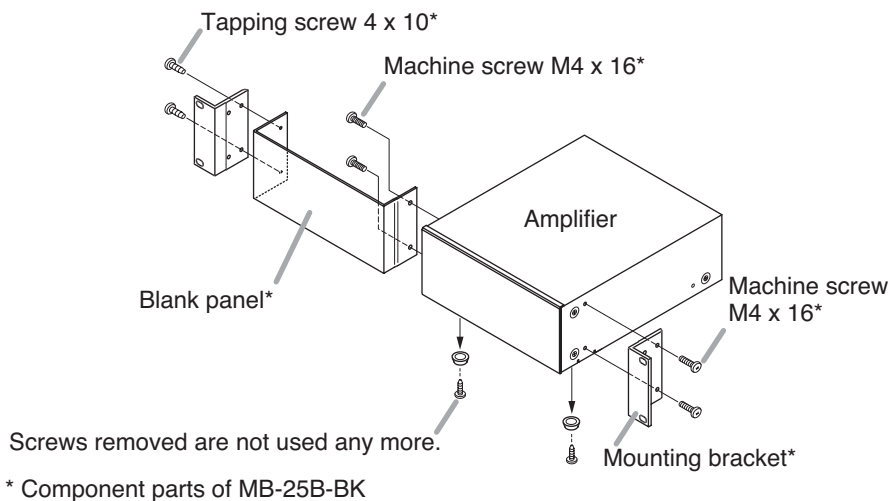


[MB-25B-BK]

Remove 4 plastic feet on the bottom surface.

Note that these removed screws are not used.

Attach the MB-25B-BK to the unit using the supplied 4 screws.

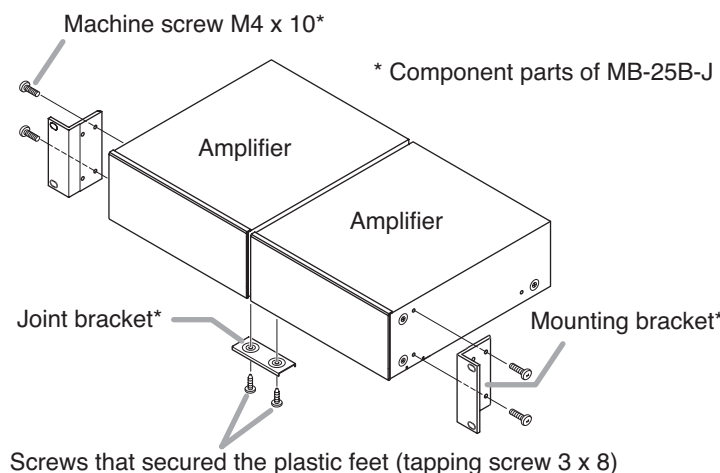


[MB-25B-J]

The MB-25B-J is designed to mount two BA-235 (BA-260) units in a single rack.

When using this bracket, remove 4 plastic feet on the bottom surface of each unit and joint the 2 units with a joint bracket, as illustrated below.

Then attach the mounting brackets using the supplied 4 screws.



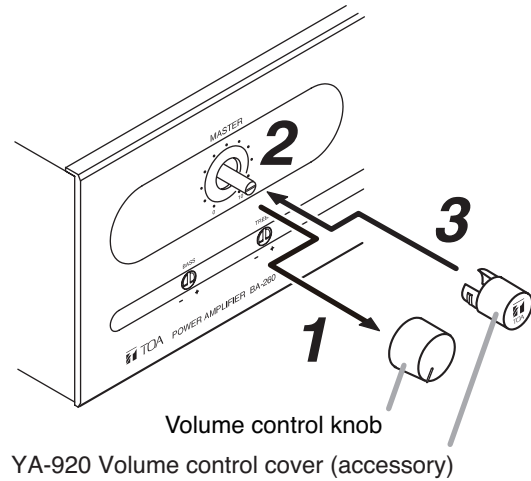
12. VOLUME SETTING

Output levels are adjustable with the Master volume control. For music play or announcement, adjust the volume control so that the signal indicator lights intermittently. Note that the sound quality is downgraded when the peak indicator remains lit.

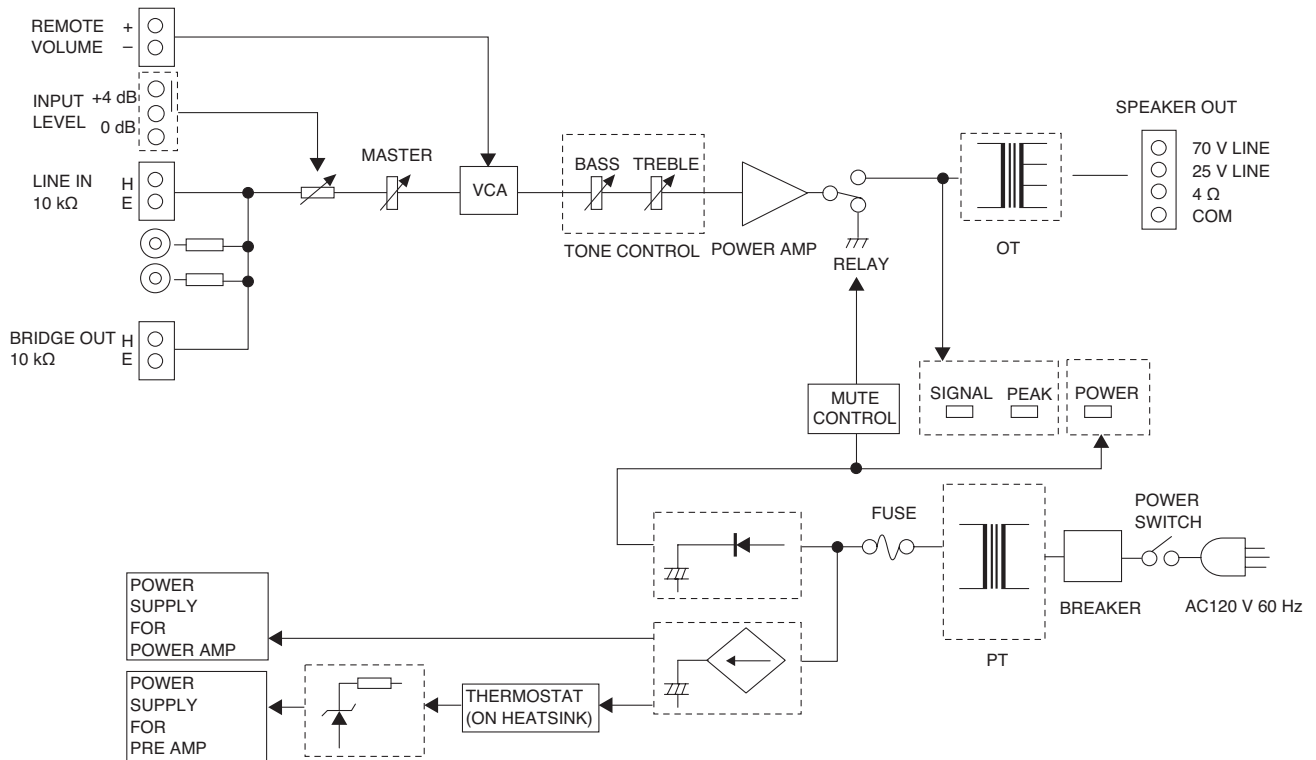
13. VOLUME CONTROL COVER

To prevent the accidental change of the Master volume control setting on the front panel, it is recommended to replace its control knob with the supplied YA-920 Volume Control Cover. Follow the procedure below for its replacement.

- Step 1.** Remove the control knob.
- Step 2.** Adjust the Master volume control (without knob) to an appropriate level.
- Step 3.** Attach the YA-920 onto the control.

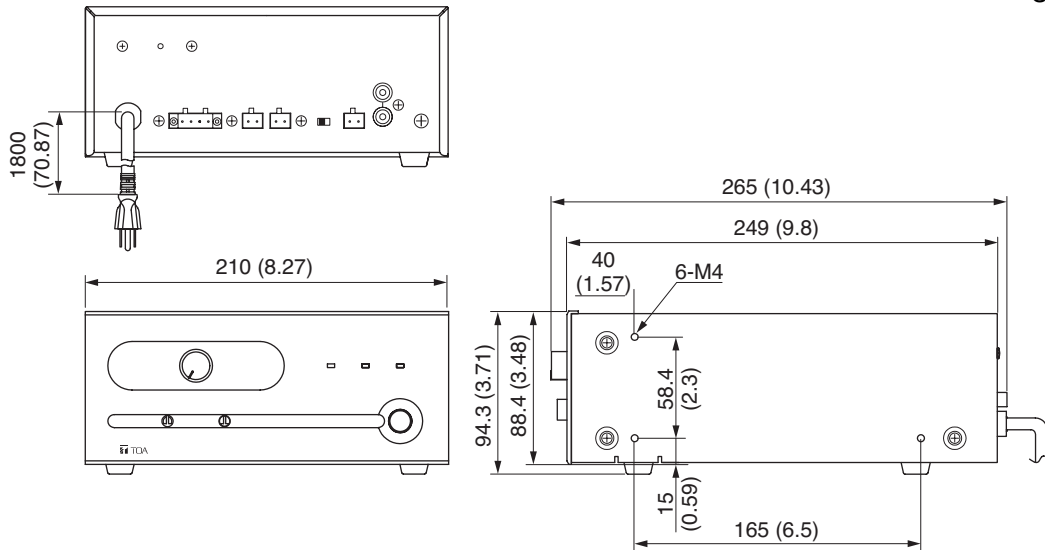


14. BLOCK DIAGRAM



15. DIMENSIONAL DIAGRAM

Unit: mm (in)



16. SPECIFICATIONS

Model No.	BA-235	BA-260
Power Source	120 V AC, 60 Hz	
Rated Output	35 W	60 W
Power Consumption	90 W (rated output) 52 W (based on cULus standards)	130 W (rated output) 66 W (based on cULus standards)
Frequency Response	50 Hz – 20 kHz	
Total Harmonic Distortion	0.5% or less, at 1 kHz, rated output	
Input	Line input	
Input Sensitivity/ Impedance	Line input: 0 dB*/+4 dB* (selectable), 10 k Ω , unbalanced, removable terminal block or RCA jacks	
Output	Speaker Output	4 Ω , 25 V (18 Ω) and 70 V (140 Ω) balanced, removable terminal block
	Bridge Output	Parallel in Line input, removable terminal block
Output Regulation (1 kHz)	Under 2 dB, no load to full load	
S/N Ratio	Line input: Over 80 dB (Band Pass: 20 Hz – 20 kHz, Tone Controls: Centered)	
Tone Control	Bass: ± 10 dB at 100 Hz, Treble: ± 10 dB at 10 kHz	
Control	Master gain control Bass tone control, Treble tone control Input level selector switch Remote volume control Power ON/OFF switch	
Indicator	Power LED, Signal level LED, Peak LED	
Other Feature	Automatic electronic drive limiter	
Operating Temperature	0 to 35 $^{\circ}$ C (32 to 95 $^{\circ}$ F)	
Operating Humidity	35 % to 80 % RH (no condensation)	
Finish	Panel: ABS resin, black Case: Steel plate, black, paint	
Dimensions	210 (w) x 94.3 (h) x 265 (d) mm (8.27" x 3.71" x 10.43")	
Weight	4 kg (8.82 lb)	4.6 kg (10.14 lb)

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• Accessories

YA-920 Volume control cover 1
Removable terminal plug (2P) 3

Removable terminal plug (4P) 1

• Optional products

Rack mounting brackets : MB-25B-BK, MB-25B-J