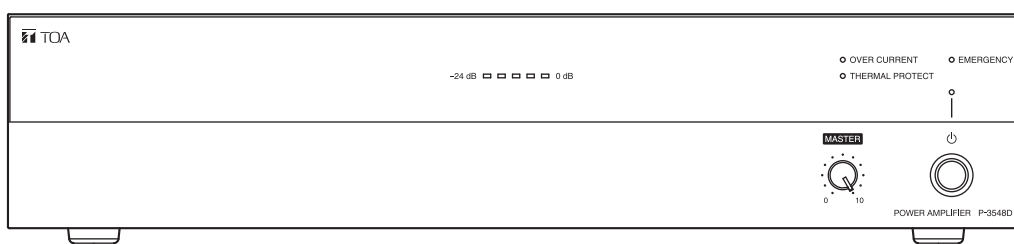




INSTRUCTION MANUAL

POWER AMPLIFIER

P-3548D



Thank you for purchasing TOA's Power Amplifier.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

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1. 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.

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.
- 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.
- Since the unit is designed for indoor use, do not install it outdoors. If installed outdoors, the aging of parts causes the unit to fall off, resulting in personal injury. Also, when it gets wet with rain, there is a danger of electric shock.
- The terminals marked with the symbol  are hazardous live.
The external wiring to these terminals requires installation by an instructed person.

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.
- Do not touch a power supply plug during thunder and lightning, as this may result in 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. Also, periodically clean the ventilation slots of dust.
- 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 switch off the unit's power 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.
 - Rack-mounting screws are not supplied with the optional MB-25B Rack mounting bracket. Prepare them that are appropriate for the equipment rack.

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. Doing so may cause the connected speakers to heat, resulting in a fire.

Be sure to use the supplied power cord. Using any other power cord may cause electric shock.

- Contact your TOA dealer as to the 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.

Warning: Operation of this equipment in a residential environment could cause radio interference.

- The socket-outlet shall be installed near the equipment and the plug (disconnecting device) shall be easily accessible.
- The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

2. GENERAL DESCRIPTION

The P-3548D Power amplifier delivers 480 W power output.

It is so designed that its power ON/OFF can be remotely controlled when used in conjunction with A-3500D series or A-3600D series Mixer amplifier (option).

It employs a PFC circuit.

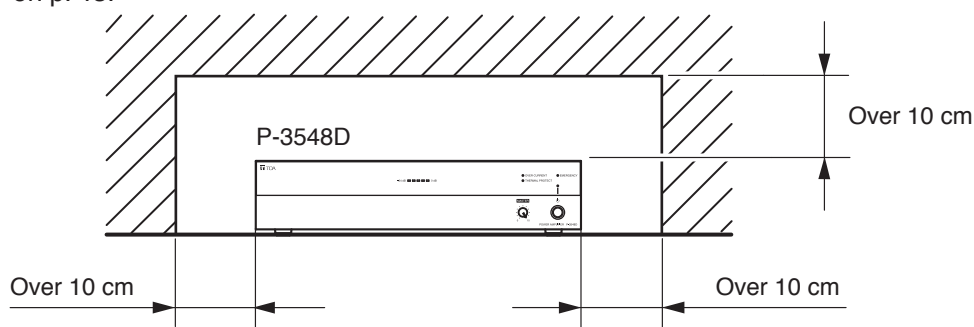
The P-3548D can also be used as a stand-alone amplifier.

3. FEATURES

- Two parallel inputs, one is speaker line input (–10 dB/0 dB), the other is line input.
- Master volume control and independent speaker line input volume control.
- Lightweight owing to the built-in digital power amplifier unit.
- Switchable speaker output 4 – 16 Ω or 100 V line.
- Output level meter.
- Master volume control to simultaneously adjust all input levels.
- Power remote switch by contact input.

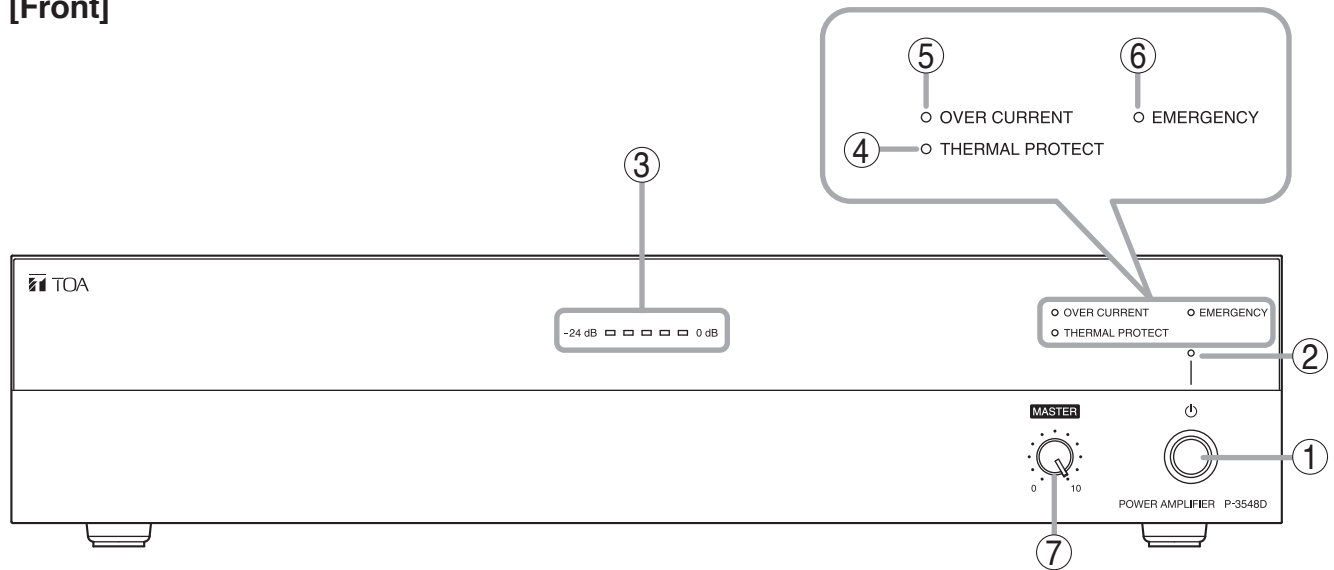
4. INSTALLATION PRECAUTIONS

- The supplied power supply cord is designed for exclusive use with the unit. Never use it with other equipment.
- Install the unit in a well-ventilated environment so that temperature inside the unit will not rise.
- When installing the unit on the desk, keep the unit over 10 cm away from objects that may obstruct air flow as shown below.
- When installing the unit in an equipment rack, mount perforated panels. See "INSTALLING TO AN EQUIPMENT RACK" on p. 13.



5. NOMENCLATURE AND FUNCTIONS

[Front]



1. Power switch

Press this switch to turn on the power. To turn off the power, press this switch again.

Note

Operation of the power switch is disabled while the Power remote control input terminal (12) or Emergency control input terminal (14) is closed.

2. Power indicator (Green)

Lights when the power is switched on and goes off when it is switched off.

3. LED level meter (Green x 3, Orange x 1, Red x 1)

Displays the output level.

Adjust each volume control knob for an appropriate output sound so that the red indicator does not light.

Operating the unit while the red indicator remains lit causes the sound quality to degrade.

4. Thermal protection indicator (Red)

Lights while the internal protection circuit is operating.

5. Overcurrent protection indicator (Red)

Lights while the overcurrent protection circuit is operating if overcurrent flows through the speaker output.

6. Emergency broadcast indicator (Red)

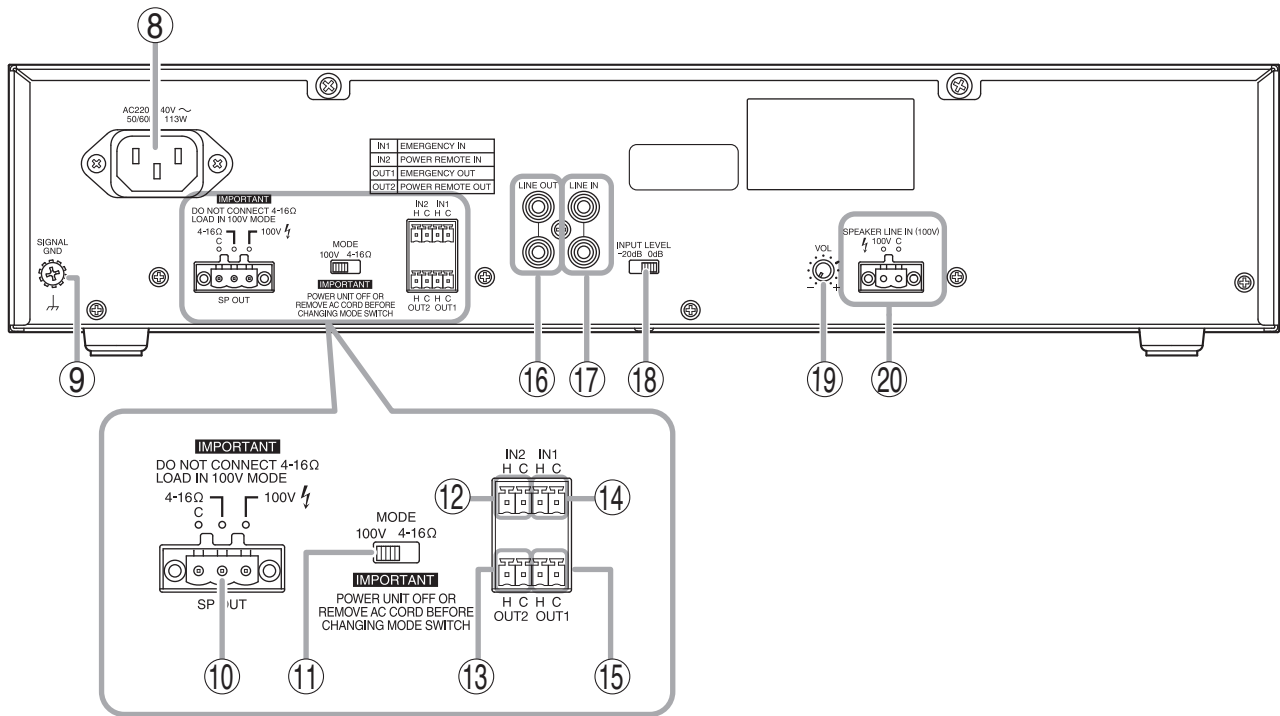
Lights while the Emergency control input terminals (14) are closed.

7. Master volume control

Adjusts all the volume levels simultaneously.

Rotate the knob clockwise to increase the whole volume level and counterclockwise to decrease it. (See "CONTROL SETTINGS" on p. 13.)

[Rear]



8. AC inlet

Connect the supplied power cord to this receptacle.

CAUTION

Be sure to use the supplied power cord.
Using any other power cord may cause electric shock.

9. Functional ground terminal

Noise may be generated when external equipment is connected to the unit. In this case, connect this terminal to the functional ground terminal of the external equipment, and the noise may be reduced.

Note

This terminal is not for protective ground.

10. Speaker output terminal

Removable terminal block (5.00 mm, 3 pins)
Outputs the audio signals of the power amplifier output. (See "BLOCK DIAGRAM" on p. 14.)
The specifications of each output are as follows:
Rated output: 480 W
Low impedance: 4 – 16 Ω
High impedance (100 V Line): 21 Ω

Notes

- Never use the low impedance and high impedance terminals simultaneously. Doing so may cause damage to the unit or the peripheral equipment.
- Never make connection to low impedance terminal when the Impedance setting switch (11) is set to 100 V.

Tip

To change impedance between high and low, use the Impedance setting switch (11).

11. Impedance setting switch

Changes the speaker output impedance either to low or high.

100 V: High impedance

4 – 16 Ω: Low impedance

Notes

- Make sure that the power is switched OFF before changing this switch setting. Change cannot be performed when the power is on.
- The impedance remains as it is even if you change the switch setting when the power is ON. However, the impedance will change when you turn the power ON again after turning the power OFF.

12. Power remote control input terminal

Short-circuit current: 10 mA or less, open voltage: 35 V DC or less, removable terminal block (3.50 mm, 4 pins)

Permits the unit's power to be remotely turned ON or OFF by way of make contacts.

For details, refer to "Remote Power ON/OFF Control Connection" on p. 10 and "Emergency Input and Control Input Terminal Connections" on p. 11.

13. Power remote control output terminal

Open collector output, withstand voltage: 30 V DC or less, current: 25 mA or less, removable terminal block (3.50 mm, 4 pins)

An output terminal that can be used for remote control of other equipment. Operates in synchronization with the unit's power ON/OFF.

When the unit's power is on, it is activated.

14. Emergency control input terminal

Short-circuit current: 10 mA or less, open voltage: 35 V DC or less, removable terminal block (3.50 mm, 4 pins)

Permits the unit's power to be remotely turned ON or OFF by way of make contacts.

For details, refer to "Emergency Input and Control Input Terminal Connections" on p. 11.

15. Emergency control output terminal

Open collector output, withstand voltage: 30 V DC or less, current: 25 mA or less, removable terminal block (3.50 mm, 4 pins)

An output terminal that can be used for remote control of other equipment.

It is activated during the emergency broadcast made from the unit.

16. Line output jacks

0 dB*, 600 Ω , unbalanced type, RCA pin jack x 2
Pre-fader signals (signals before being adjusted with the Master volume control) are output.

17. Line input jacks

0 dB*/–20 dB* (switchable), 600 Ω , transformer balanced, RCA pin jack x 2

Input jacks dedicated for LINE

18. Input level setting switch

Set the input sensitivity level (–20 dB or 0 dB) of the Line input jacks (17).

19. Speaker line input volume control

Adjust the volume values of the Speaker line input.

Rotate the knob clockwise to increase the volume value and counterclockwise to decrease it.

20. Speaker line input terminals

40 dB* (100 V line), 65 k Ω , transformer balanced, removable terminal block (5.00 mm, 2 pins).

The input volume can be changed with the Speaker line input volume control (19).

Connects to 100 V line speaker output.

* 0 dB = 1 V

6. CONNECTIONS

External cable wiring must be only carried out by qualified and trained personnel.

6.1. Speaker Connection

For cable wiring to the removable terminal block, refer to p. 12.

Notes

- Never make connection to both 4 – 16 Ω (low impedance) and 100 V line (high impedance) terminals simultaneously.
- Never make connection to 4 – 16 Ω terminal when the Impedance setting switch is set to 100 V.

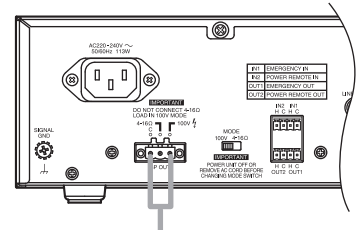
Tip

Recommended speaker cable is IV or HIV cable with thickness described below.

Solid copper cable: $\phi 0.32 - 2.0$ mm

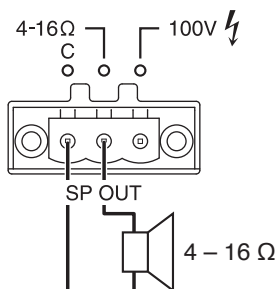
Stranded copper cable: 0.05 – 3.3 mm (AWG 30 – 12)

P-3548D

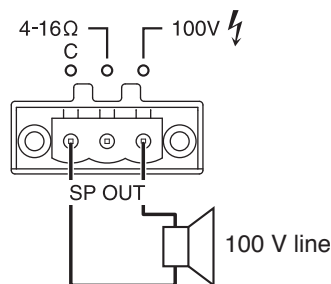


Speaker output terminal

[Low impedance connection]



[High impedance connection]

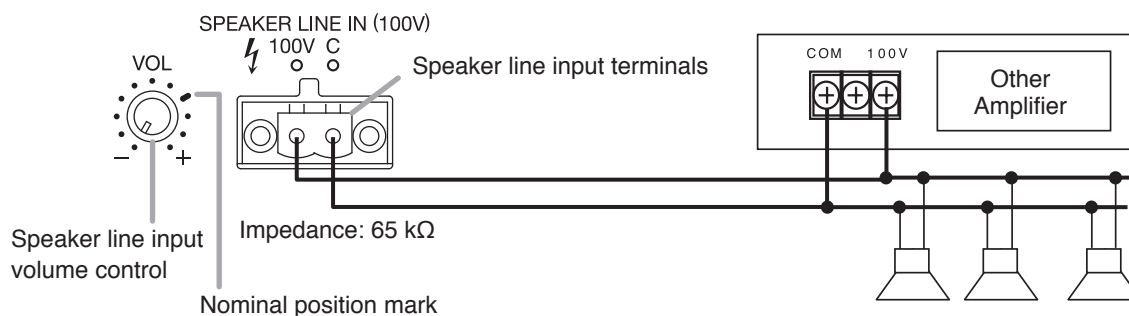


Combined impedance : 21 Ω

6.2. Speaker Line Input Connection

For cable wiring to the removable terminal block, refer to p. 12.

Connect the high impedance (100 V) speaker wiring of other amplifier to the Speaker line input terminals.



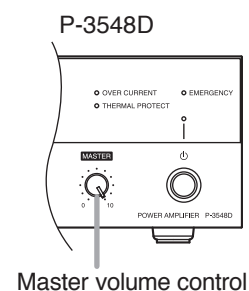
[Volume adjustment]

First, set the Speaker line input volume control at the nominal position mark.

Then, adjust the volume with the Master volume control on the front panel while monitoring the sound being broadcast from the speakers.

When the volume is still insufficient even if you turn the Master volume control fully clockwise, adjust the volume by turning the Speaker line input volume control clockwise from the nominal position mark.

When the sound is distorted even if you adjust the volume with the Master volume control, adjust the volume by turning the Speaker line input volume control counterclockwise from the nominal position mark.

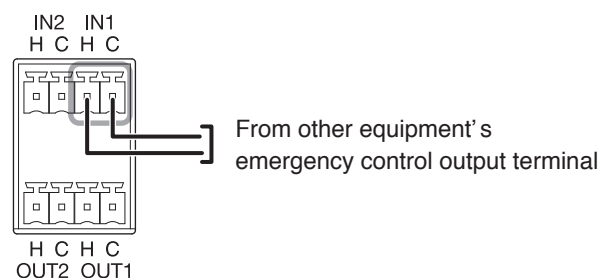


6.3. Emergency Control Connection

For cable wiring to the removable terminal block, refer to "Removable Terminal Plug Connection" on p. 12.

6.3.1. Emergency control input terminal connection

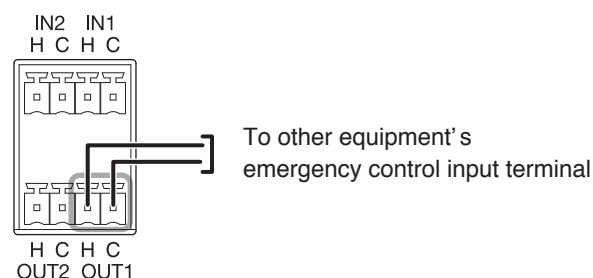
Shorting the Emergency control input terminals forcibly turns the unit's power ON, delivering signals at the Line output and speaker output terminals bypassing the Master Volume Control.



Control input signal specification: Short-circuit current: 10 mA or less, open voltage: 35 V DC or less

6.3.2. Emergency control output terminal connection

Use this terminal when remotely controlling other equipment. This terminal is activated while the emergency broadcast is in progress from this unit.



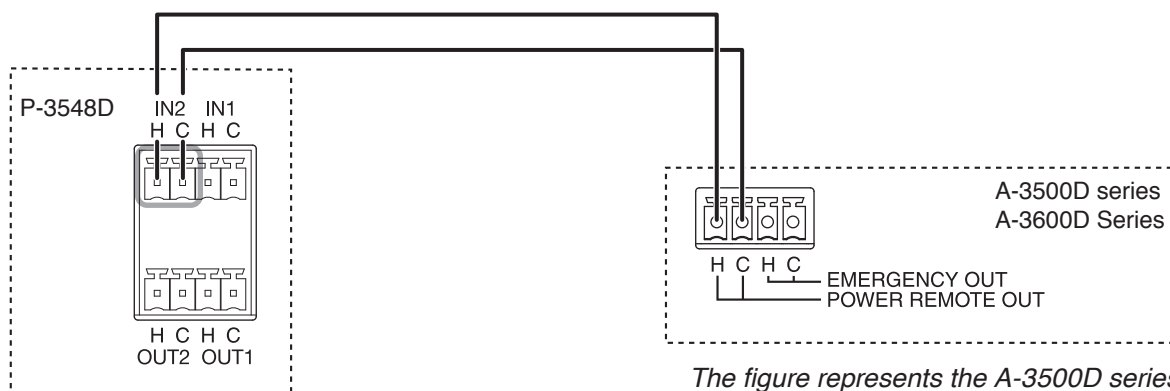
Control output signal specification: Open collector output (polarized), withstand voltage: 30 V DC or less, current: 25 mA or less

6.4. Remote Power ON/OFF Control Connection

For cable wiring to the removable terminal block, refer to p. 12.

6.4.1. Remote power control input terminal connection

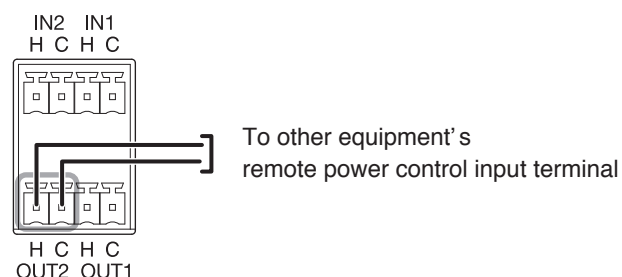
With the P-3548D's power turned OFF, it can be remotely turned ON from the optional A-3500D series or A-3600D series Mixer amplifier by making the Remote IN-OUT terminal connections as shown below. (This remote control operates only when the P-3548D's power is turned OFF.)



Control input signal specification: Short-circuit current: 10 mA or less, open voltage: 35 V DC or less

6.4.2. Remote power control output terminal connection

Use this terminal when remotely controlling other equipment. This terminal is activated when the unit is turned ON.

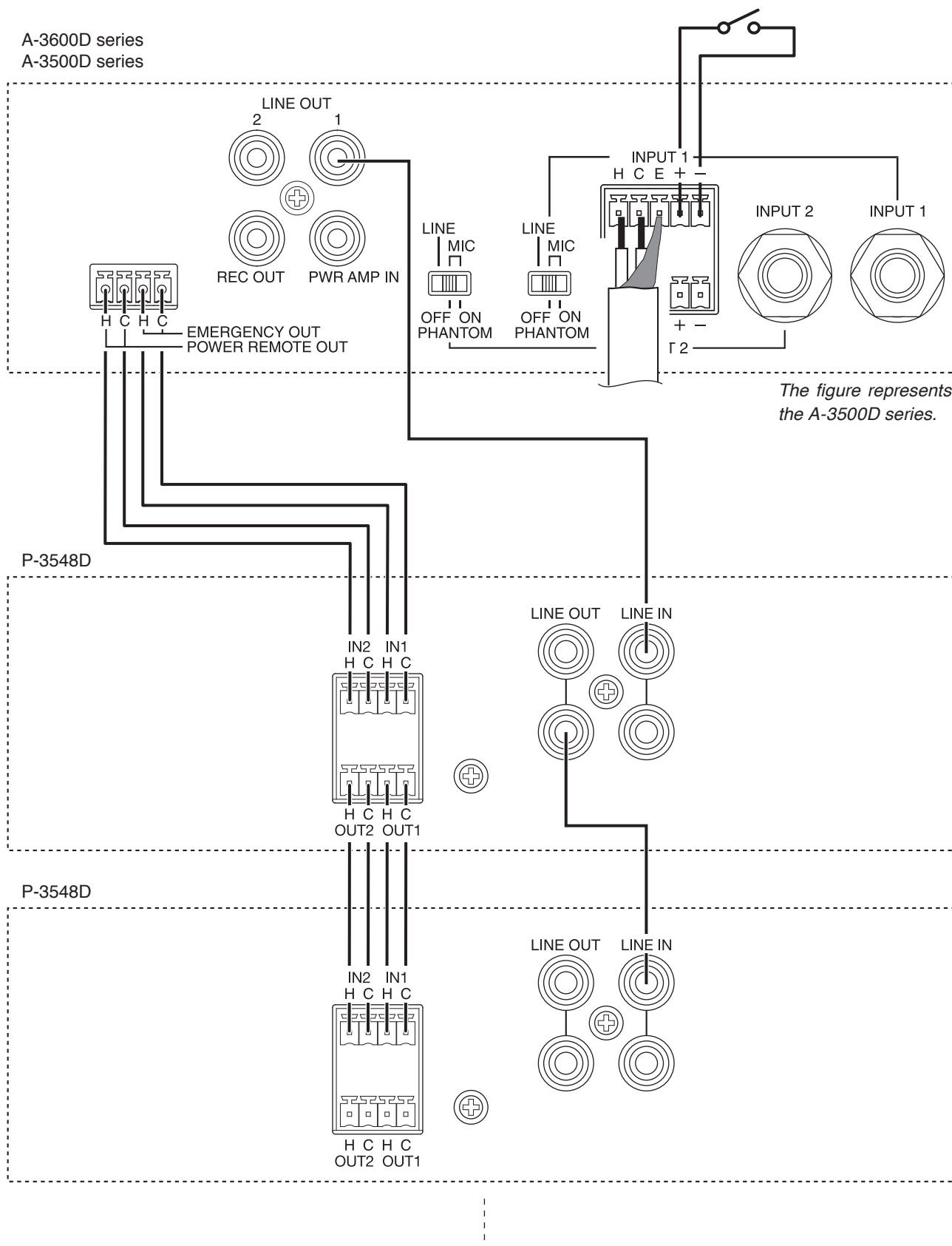


Control output signal specification: Open collector output (polarized), withstand voltage: 30 V DC or less, current: 25 mA or less

6.5. Emergency Input and Control Input Terminal Connections

For cable wiring to the removable terminal block, refer to p. 12.

While the Emergency control input terminals remain shorted, the power of all the connected A-3500D series or A-3600D series, and P-3548Ds is turned on, and the A-3500D's or A-3600D's ZONE 1 and 2 speaker outputs are enabled, allowing only Emergency input signals to go through bypassing the master volume control. Opening the Emergency control input terminals automatically returns the muted signals to the original level.



6.6. Removable Terminal Plug Connection

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. Only when the fixing screw is inserted, tighten the fixing screw.

Notes

- Do not reverse **Steps 1** and **2** above. Poor contact may result if force is applied to the unit's internal circuit board pins while the terminal screws are being tightened.
- When detaching the terminal plug, pull it straight out. Pulling it out at an angle may cause the terminal plug or terminal block to break.

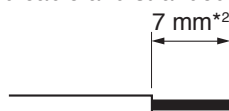
Tips

- Applicable cable size

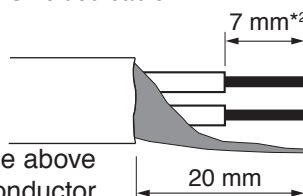
	For speaker output terminal	For other terminals
Conductor cross-section area	0.05 – 3.3 mm ²	0.08 – 2.0 mm ²
AWG	AWG 30 – 12 or equivalent	AWG 28 – 14 or equivalent

- Cable sheath to trim

Solid cable and stranded cable



Shielded cable



*2 Expose 8 mm or more when using the above ferrule terminal, and cut off an extra conductor protruding from the sleeve.

Note

Avoid soldering stranded or shielded cable, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.

- When connecting 2 cables or a shielded cable to a single terminal, use a ferrule terminal with an insulation sleeve to crimp the cables because such cable conductors could become loose.

(1) Recommended ferrule terminals for signal cables

(made by Phoenix Contact)

Unit: mm

	Model Number	a	b	l ₁	l ₂
①	AI 0,34-8 TQ	2	0.8	12.5	8
②	AI 0,5-8 WH	2.5	1.1	14	8

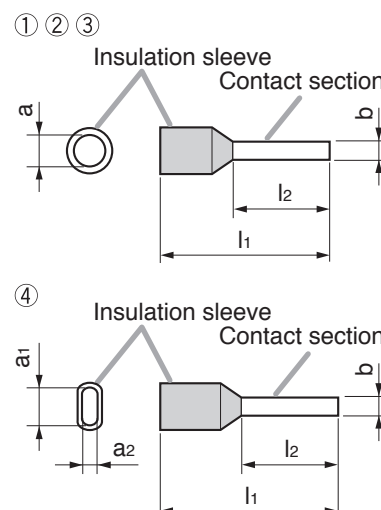
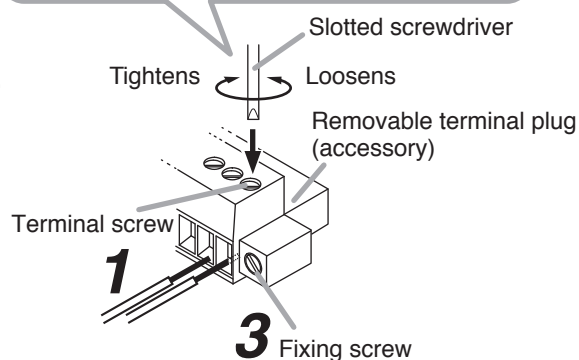
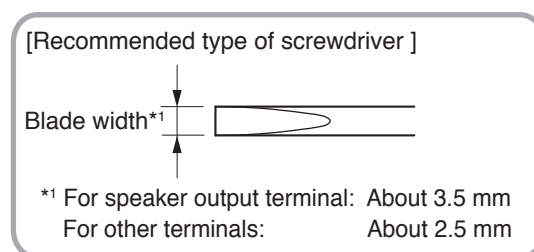
(2) Recommended ferrule terminals for speaker cables

(made by Phoenix Contact)

Unit: mm

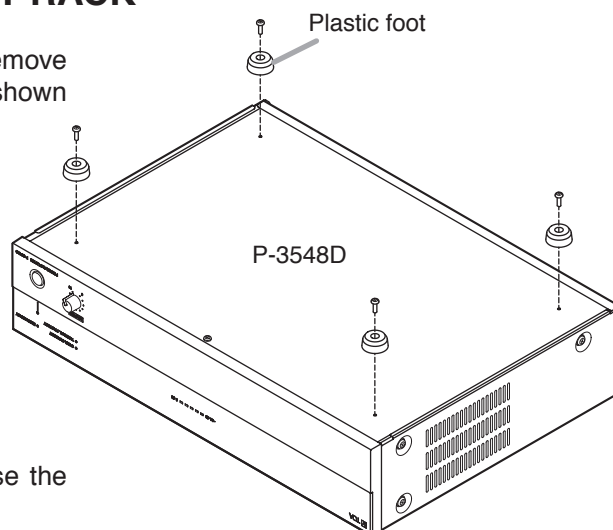
	Model Number	a	a ₁	a ₂	b	l ₁	l ₂
③	AI 1,5-8 BK	3.4	—	—	1.8	14	8
④	AI-TWIN 2 x 1,5-8 BK	—	6.6	3.6	2.3	16	8

Crimping tool: CRIMPFOX 10S (made by Phoenix Contact)



7. INSTALLING TO AN EQUIPMENT RACK

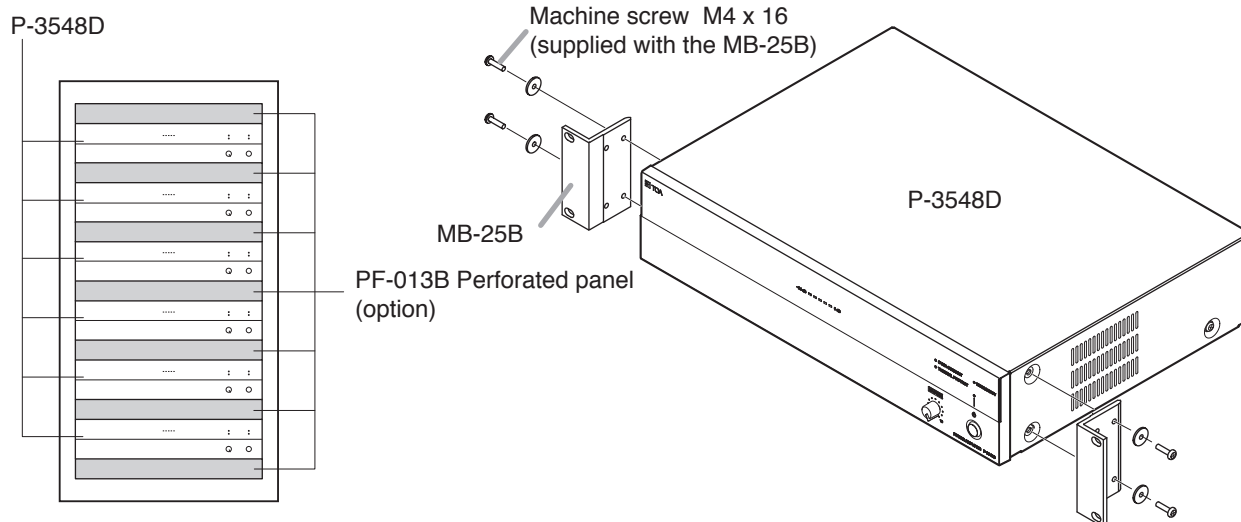
When installing the unit to an equipment rack, remove the four plastic feet screwed on the unit's base as shown below.



When installing the unit to an equipment rack, use the optional MB-25B Rack mounting bracket.

CAUTION

Rack-mounting screws are not supplied with the optional MB-25B Rack mounting bracket. Prepare them that are appropriate for the equipment rack.



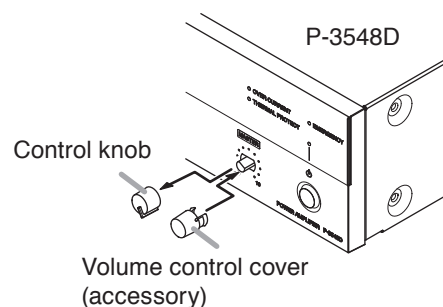
Note

To improve ventilation, ensure that a perforated panel (panel with air openings) of 1-unit size or greater is mounted over and under each unit, as well as on the top and at the bottom of the rack.

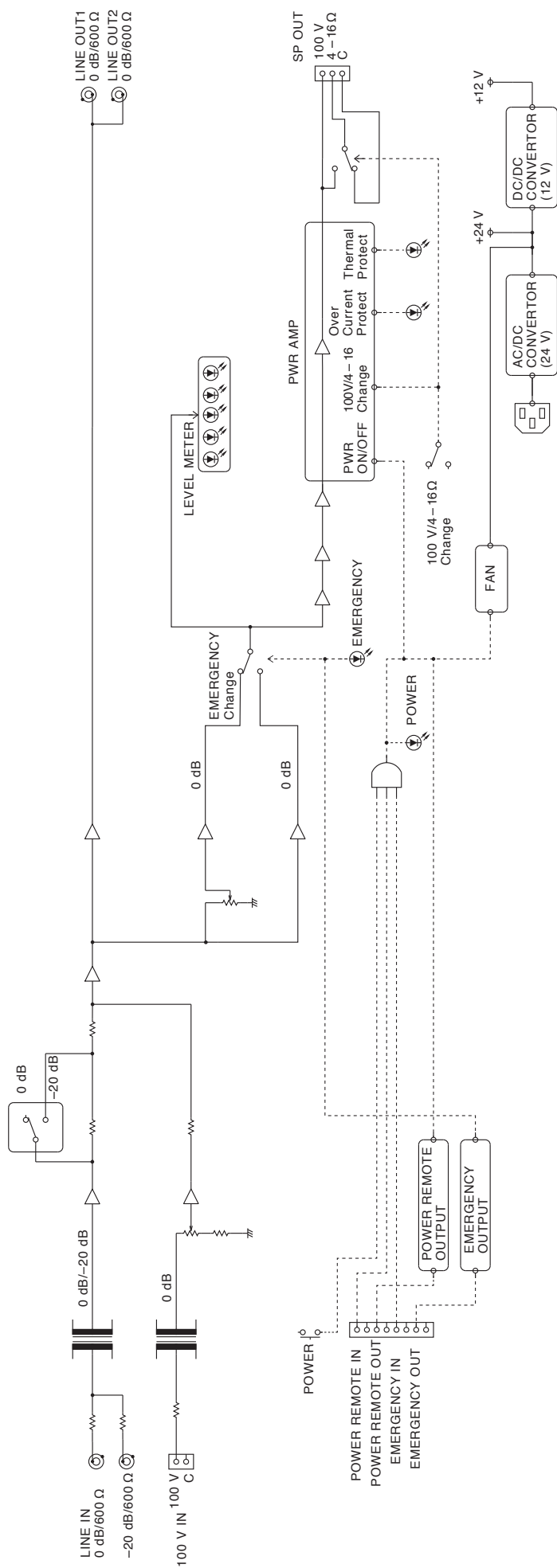
8. CONTROL SETTINGS

Output levels are adjustable with individual volume controls. For music play or announcements, adjust the corresponding volume control so that the red indicator doesn't light. Note that the sound quality is downgraded when the red indicator remains lit.

To prevent the accidental change of the settings of input volume, remove its knob after setting it to the desired position and attach the supplied volume control covers instead.



9. BLOCK DIAGRAM



10. SPECIFICATIONS

Power Source	220 – 240 V AC, 50/60 Hz
Rated Output	480 W
Power/Current Consumption	601 W (rated output), 113 W (based on EN62368), 200 mA or less (when power switch is OFF)
Frequency Response	50 Hz – 20 kHz ± 3 dB (1/8 rated output)
Distortion	1% or less at 1 kHz, rated power (20 kHz LPF (AUX-0025))
Signal to Noise Ratio	88 dB or more (Master volume: min) 76 dB or more (Master volume: max) (A-weighted)
Audio Input	LINE IN: 0 dB*/–20 dB* (switchable), 600 Ω , transformer balanced, RCA pin jack x 2 SPEAKER LINE IN: 40 dB* (100 V line), 65 k Ω , transformer balanced, removable terminal block (5.00 mm, 2 pins)
Audio Output	SPEAKER OUT: Low impedance (4 – 16 Ω)/High impedance (21 Ω), removable terminal block (5.00 mm, 3 pins) LINE OUT: 0 dB*, 600 Ω , unbalanced, RCA pin jack x 2
Control Input	POWER REMOTE IN: No-voltage make contact input, open voltage: 35 V DC or less short-circuit current: 10 mA or less, removable terminal block (3.50 mm, 4 pins) EMERGENCY IN: No-voltage make contact input, open voltage: 35 V DC or less short-circuit current: 10 mA or less, removable terminal block (3.50 mm, 4 pins)
Control Output	POWER REMOTE OUT: Open collector output, withstand voltage: 30 V DC or less, control current 25 mA or less, removable terminal blocks (3.50 mm, 4 pins) EMERGENCY OUT: Open collector output, withstand voltage: 30 V DC or less, control current 25 mA or less, removable terminal blocks (3.50 mm, 4 pins)
Indicators	Power indicator, LED level meter, Over current protection indicator, Thermal protection indicator, Emergency broadcast indicator
Operating Temperature	–10 to +40° C
Operating Humidity	85%RH or less (no condensation)
Finish	Panel: ABS resin, black Case: Surface-treated steel plate, black, paint
Dimensions	420 (w) x 96.1 (h) x 313.1 (d) mm
Weight	5 kg

* 0 dB = 1 V

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

• Accessories

Power cord (2 m)	1
Removable terminal plug (5.00 mm, 2 pins)	1
Removable terminal plug (3.50 mm, 4 pins)	2
Removable terminal plug (5.00 mm, 3 pins)	1
Volume control cover	1

• Optional products

Rack mounting bracket:	MB-25B
Perforated panel:	PF-013B

