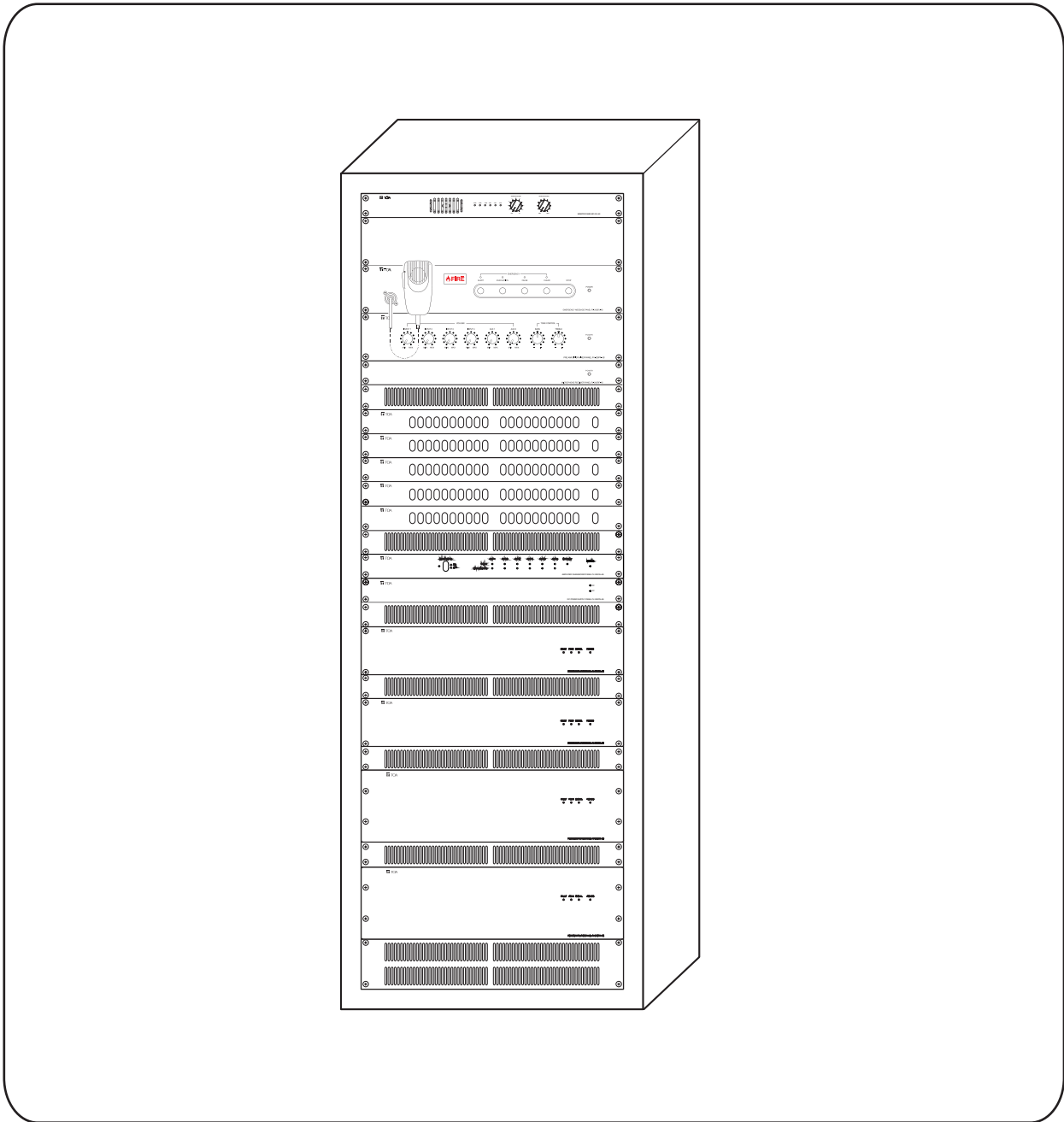




INSTRUCTION MANUAL

EMERGENCY PUBLIC ADDRESS SYSTEM

FV-200 SERIES



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

TOA Corporation

TABLE OF CONTENTS

1. SAFETY PRECAUTIONS	4
2. SYSTEM SUMMARY	6
3. FEATURES	7
4. INSTALLATION PRECAUTIONS	7
5. NOMENCLATURE AND FUNCTIONS	8
5.1. FV-200EV-AS Emergency Message Panel	8
5.2. FV-200PP-AS Pre-Amplifier Mixer Panel	10
5.3. FV-200RF-AS Microphone Receiver Panel	13
5.4. FV-200CA-AS Changeover Amplifier Panel	14
5.5. FV-224PA-AS 240W Power Amplifier Panel	15
5.6. FV-248PA-AS 480W Power Amplifier Panel	16
5.7. RM-200M Remote Microphone	17
5.8. RM-210 Remote Microphone Extension	18
5.9. VP-200VX Power Amplifier Input Module	18
5.10. FV-200PS-AS DC Power Supply Panel	19
6. INSTALLATION	20
6.1. Panels Installation	20
6.1.1. Installing on the Cabinet Rack	20
6.1.2. Cabinet Rack Installation	20
6.1.3. Installation Example	21
6.2. Installing RM-200M	22
6.2.1. Installing RM-200M on the wall	22
6.2.2. Installing RM-210 on the wall	23
6.2.3. Linking the RM-200M with the RM-210 (For Desktop Mounting)	24
6.2.4. Inserting the name label	25
6.2.5. Dimensional diagram for printing devices	25
6.2.6. Pattern paper for hand writing	26
6.3. Installing the VP-200VX Power Amplifier Input Module in the Power Amplifiers	27
6.4. Ground lifting using the VP-200VX Power Amplifier Input Module	28
7. CONNECTIONS	28
7.1. Basic System Configuration	29
7.2. 24 V DC Power Supply Expansion	30
7.3. FV-200EV-AS Connection	31
7.4. Timer-Operated Equipment	31
7.5. Telephone Paging	32
7.6. RF-PP Link Connection	33
7.7. RM-200M Connection	34
7.7.1. RM-200M Connection without AC adapter	35
7.7.2. RM-200M Connection with AC adapter	36
7.8. BGM Instrument	36
7.9. Power Amplifier Connection	37
7.9.1. 1-Channel Broadcast	37
7.9.2. 2-Channel Broadcast	37
7.9.3. Power Amplifier Expansion	38
7.9.4. Power Amplifier Connection with SX-2000 system	39
7.9.5. Power Amplifier Connection with VX-2000 system	39
7.10. Connecting the Speaker and Attenuators	40
7.11. Changeover Amplifier Connection	41
7.12. Changeover Amplifier Cascade Connection	42
7.13. FV-200CA-AS Wrong Connection Warning	42
7.14. Speaker Selector Connection	43
7.14.1. 2-Channel Mode using SS-2010	43
7.14.2. 1-Channel Mode using SS-1010	43
7.14.3. 1-Channel Mode using SS-1010R	44
7.15. Automatic Fire Alarm Systems	44
7.16. Fault Out Connection	45
7.17. Power Failure Backup	45
7.17.1. Providing Backup Power Using an Uninterruptible Power Supply (UPS) System	45
7.17.2. Power Backup Using the VX-2000DS Emergency Power Supply Panel	45


7.17.3. Wiring Diagram Connection to UPS	46
7.17.4. Wiring Diagram Connection to VX-2000DS	47
8. SETTINGS	48
8.1. FV-200RF-AS Settings	48
8.1.1. DIP Switch Functions	48
8.1.2. Priority Setting : Last-in-first-out / First-in-first-out / Individual priority	48
8.1.3. RM-200M Unit Number Setting	48
8.2. REMOTE MICROPHONE SETTINGS	49
8.2.1. DIP Switch Functions	49
8.2.2. Unit ID Number Settings (Switch 1 and 2 operation)	49
8.2.3. Talk Key Settings (Switch 4 operation)	49
8.2.4. Compression Settings (Switch 6 operation)	49
8.3. Muting Function	50
8.4. Volume Control Settings	50
9. OPERATION	51
9.1. Emergency Broadcasts	51
9.2. General-Purpose Broadcasts	52
9.2.1. Types of General-Purpose Broadcasts	52
9.2.2. BGM Broadcast & Priority Broadcasts	52
9.2.3. Order of Priority among Priority Broadcasts	53
9.3. Emergency operating procedures	54
9.4. Broadcasting from the RM-200M	56
10. FAILURE INDICATION	58
11. SPECIFICATION	60
11.1. FV-200EV-AS Emergency Message Panel	60
11.2. FV-200PP-AS Pre Amplifier Mixer Panel	61
11.3. FV-200RF-AS Microphone Receiver Panel	62
11.4. FV-200CA-AS Amplifier Changeover Panel	63
11.5. FV-224PA-AS 240 W Power Amplifier Panel	64
11.6. FV-248PA-AS 480 W Power Amplifier Panel	65
11.7. VP-200VX Power Amplifier Input Module	66
11.8. RM-200M Remote Microphone	66
11.9. RM-210 Remote Microphone Extension	66
11.10. FV-200PS-AS DC Power Supply Panel	67


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.

 **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

FV-200PS-AS/ FV-224PA-AS/ FV-248PA-AS Only

- 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.

All units

- 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.
- Install the unit only in a location that can structurally support the weight of the unit and the mounting bracket. Doing otherwise may result in the unit falling down and causing personal injury and/or property damage.
- Owing to the unit's size and weight, be sure that at least two persons are available to install the unit. Failure to do so could result in personal injury.

- Tighten each nut and bolt securely. Ensure that the bracket has no loose joints after installation to prevent accidents that could result in personal injury.

When the unit is in use

FV-200PS-AS/ FV-224PA-AS/ FV-248PA-AS Only

- 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 qualified service personnel.
- 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 plug during thunder and lightning, as this may result in electric shock.

WARNING

When installing the unit

All units

- 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.).

CAUTION

FV-200PS-AS / FV-224PA-AS / FV-248PA-AS Only

- 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.
- To avoid electric shocks, be sure to switch off the unit's power when connecting speakers.

FV-200PS-AS / FV-224PA-AS / FV-248PA-AS Only

- If it is malfunctioning (no tone sounds.)
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.

All units

- 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.
- When unpacking or moving the unit, be sure to handle it with two or more persons. Falling or dropping the unit may cause personal injury and/or property damage.

When the unit is in use

FV-224PA-AS / FV-248PA-AS Only

- 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.

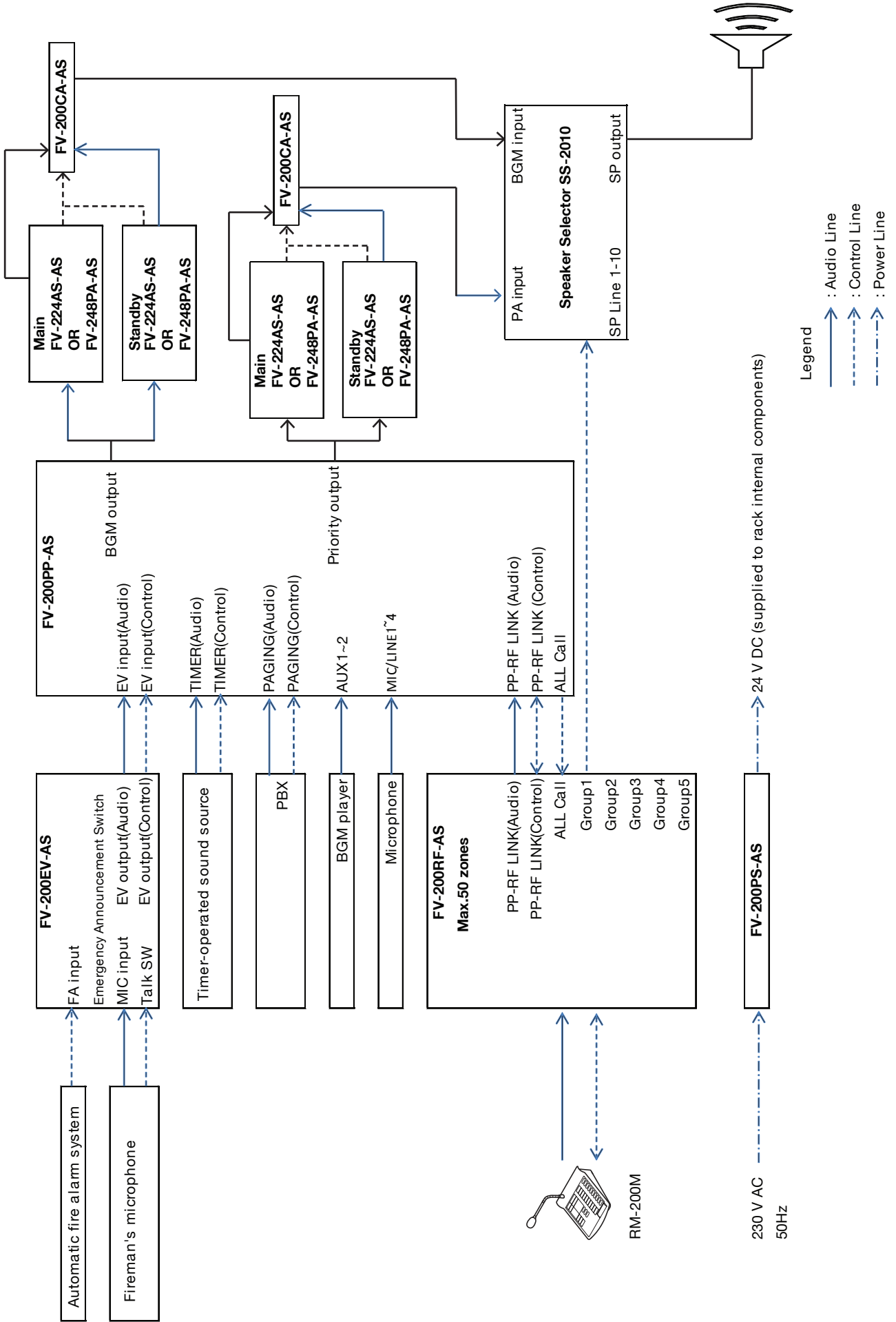
FV-200PS-AS / FV-224PA-AS / FV-248PA-AS Only

- 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.

All units

- Make sure that the volume control is set to minimum position before power is switched on. Loud noise produced at high volume when power switched on can impair hearing.
- 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.

2. SYSTEM SUMMARY

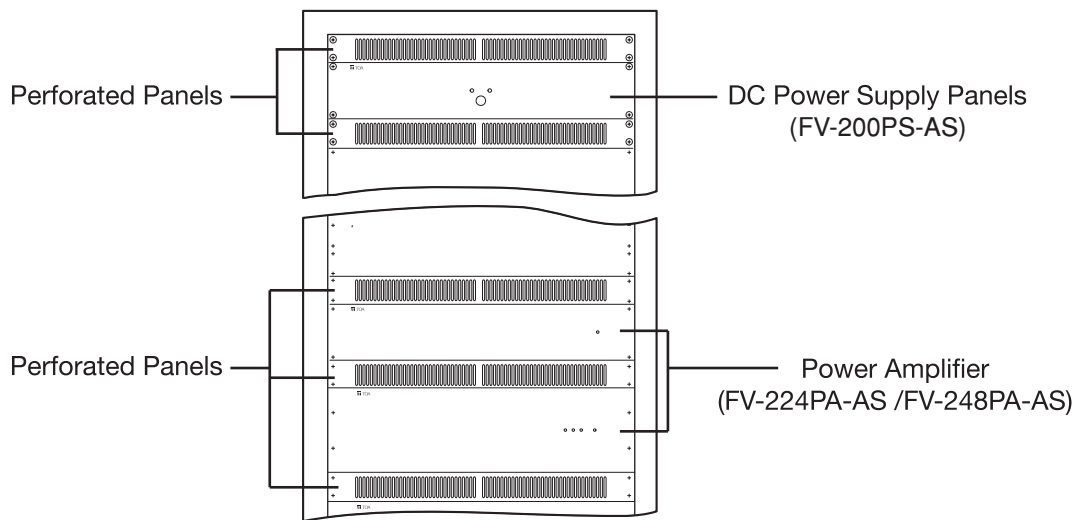


3. FEATURES

- The FV-200EV-AS is loaded with Emergency messages when shipped from the factory.
- Simultaneous 2-channel broadcasts can be made of BGM (background music) and announcement broadcasts (emergency and priority broadcasts), allowing BGM broadcasts to continue in zones not selected for announcement broadcasts, even when announcements are being made.
- Up to 4 remote microphones can be connected.
- Up to 50 speaker lines can be controlled.
- All-zone calls can be made from a Timer, Paging and Remote Microphone.

4. INSTALLATION PRECAUTIONS

- The required power voltage for this system is 230V AC. Calculate the total combined power consumption of all equipment in the system to ensure sufficient power capacity. Note that the system may not work properly due to breaker cutoff or power voltage drops when the total supply voltage is insufficient.
- About the handling of the power supply cord (FV-200PS-AS only):
The supplied power cord is intended for exclusive use with the FV-200PS-AS Power Supply Panel. Avoid using this power cord for any other equipment than the FV-200PS-AS panel.
- Ensure that the rear of the component is sufficiently distant from the rear wall to facilitate maintenance service.
- When mounting the FV-200PS-AS and FV-224PA-AS or FV-248PA-AS in an equipment rack, mount a Perforated Panel larger than 1U size* just above and below each component, as shown in the following figure.



- Each component is designed with robust construction. However, be sure to use reinforcement brackets when mounting if extra strength is required.
- No rack mounting screws are supplied with the system. Use the appropriate screws for the racks used.

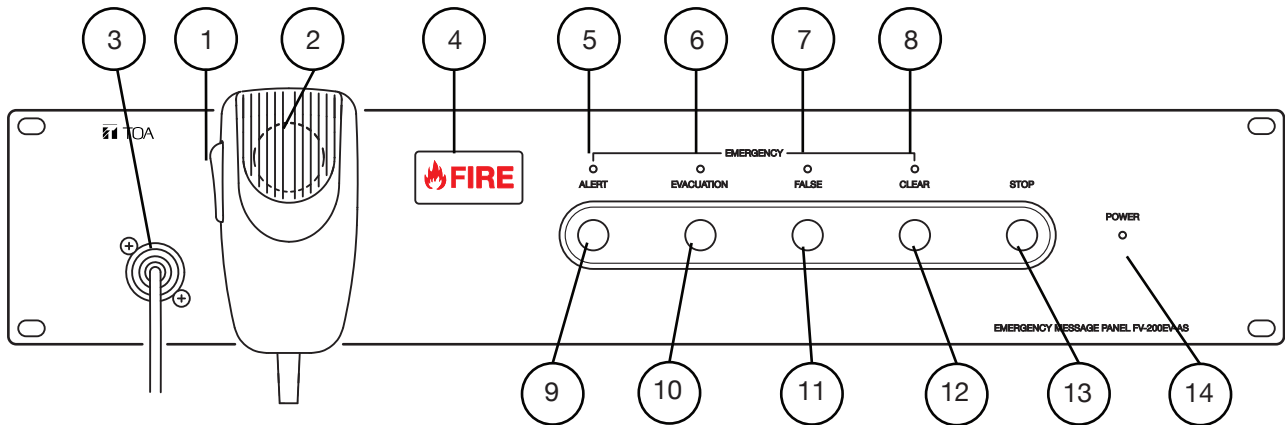
*1U size = 44.5 mm (standard size)

5. NOMENCLATURE AND FUNCTIONS

5.1 FV-200EV-AS Emergency Message Panel

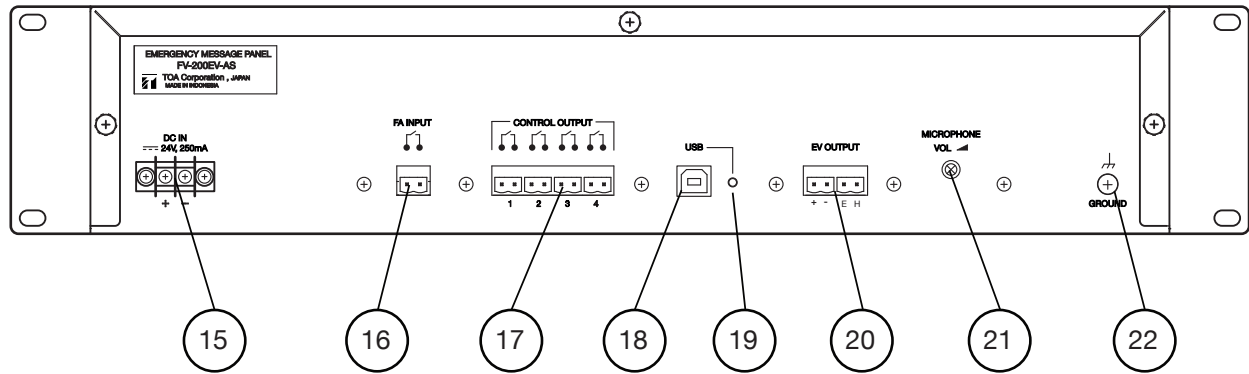
The FV-200EV-AS is an emergency broadcast operation panel for FV-200 Series Emergency Public Address Systems. This panel is not required if the system is to be used solely for general-purpose public address applications. It is possible to start and reset emergency broadcasts through manual operation. The FV-200EV-AS has a built-in voice alarm device that can make alert, evacuation, false and clear announcements.

[Front]



- 1. Talk Switch**
Hold down this switch to make announcements using the microphone.
- 2. Fireman's Microphone**
Make announcements while holding down the Talk Switch(1).
- 3. Fireman's Microphone Connector**
Connect to Fireman's Microphone(2).
- 4. Fire Indicator**
Indicates that an emergency broadcast is in progress. This indicator lights when a fire detection signal is transmitted from the automatic fire alarm system or when the Emergency message is broadcasted.
- 5. Alert Announcement Indicator**
Lights when an alert announcement is played back.
- 6. Evacuation Announcement Indicator**
Lights when an evacuation announcement is played back.
- 7. False Announcement Indicator**
Lights when a false announcement is played back.
- 8. Clear Announcement Indicator**
Lights when a clear announcement is played back.
- 9. Alert Announcement Button**
Press this button to play back alert announcements.
- 10. Evacuation Announcement Button**
Press this button to play back evacuation announcements.
- 11. False Announcement Button**
Press this button to play back false announcements.
- 12. Clear Announcement Button**
Press this button to play back clear announcements.
- 13. Stop Announcement Button**
When it is confirmed that a fire has been extinguished or other emergency situations have returned to normal, press this button to terminate emergency broadcasts after resetting the connected automatic fire alarm system.
- 14. Power Indicator**
Lights when power is supplied and the FV-200EV-AS is ready for operation.

[Rear]

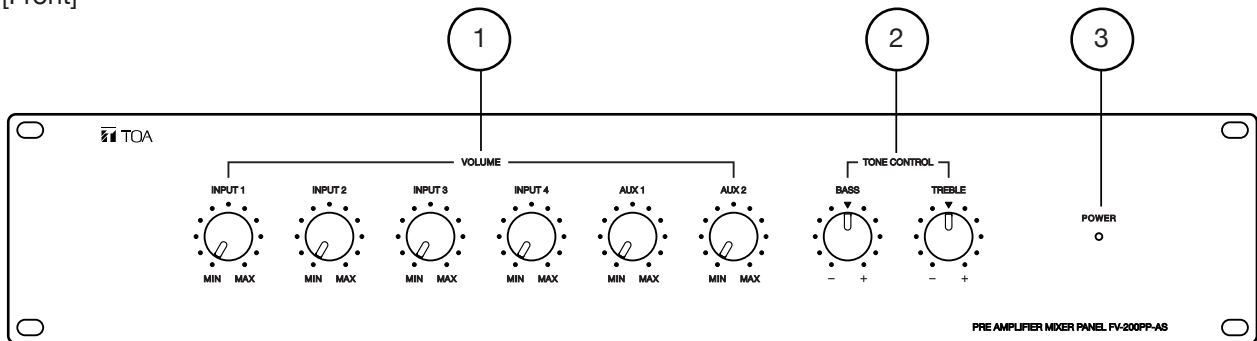


15. DC Power Input Terminal
Connect this terminal to 24 V DC power supply. Power is supplied from the FV-200PS-AS.
(M3 screw terminal; barrier distance: 6.4 mm)
16. Fire Alarm Input Terminal
Connect this terminal to the floor identifier signal transmitted from the automatic fire alarm system.
(Open voltage: 24 V DC; short-circuit current: under 5 mA; 2P terminal block)
17. Emergency Control Output Terminal
Following message activation, this terminal remains at 'make' until playback is completed
(Relay output; rated voltage: 24 V DC; current capacity: 8 A; 2P terminal block)
18. USB Terminal
Connect this terminal to a PC using the USB cable. With this connection the built in sound source can be rewritten using dedicated software. Refer to EV-20R Software Manual.
19. USB Communication Indicator
Lights or flashes during USB communications.
20. EV Output Terminal
Connect the FV-200PP-AS to this terminal.
21. Fireman's Microphone Volume
Adjust the sound volume for fireman's microphone input. Turning the control clockwise increases the volume, while turning it counterclockwise decreases the volume.
22. Functional Earth Terminal
Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-200EV-AS. This could reduce noise.
- Note: This terminal is not for protective earth.

5.2 FV-200PP-AS Pre-Amplifier Mixer Panel

The FV-200PP-AS is a standard operation panel for the FV-200 Series Emergency Public Address Systems. The FV-200PP-AS is equipped with a built-in pre-amplifier function. Audio output can be set to either a 2-channel output of background music (BGM) and priority broadcast or a 1-channel output of mixed BGM and priority broadcast.

[Front]



1. Volume Control

Adjust the sound volume for each audio input. Turning the control clockwise increases the volume, while turning it counter clockwise decreases the volume.

Controls are arranged from left to right as follows:

- INPUT 1~4
Adjusts the volume of MIC/LINE Inputs 1 – 4 on the rear panel.
- AUX 1~2
Adjusts the volume of AUX Inputs 1–2 on the rear panel.

2. Tone Control

Adjust high and low frequencies of the output. Frequencies are accentuated when the control is rotated clockwise, and attenuated when rotated counter clockwise. Controls are arranged from left to right as follows:

- BASS

Adjusts the low frequencies of the BGM Output on the rear panel.

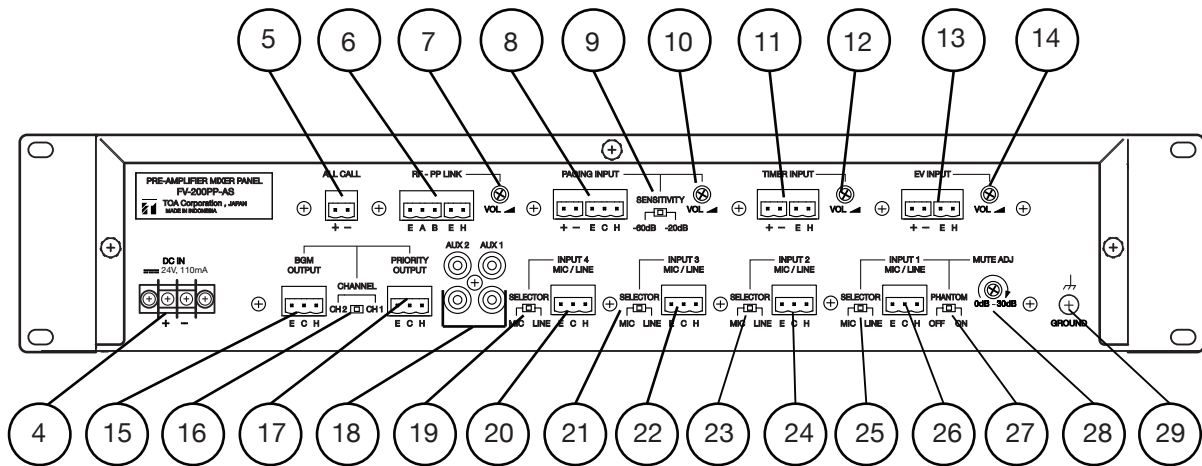
- TREBLE

Adjusts the high frequencies of the BGM Output on the rear panel.

3. Power Indicator

Lights when power is supplied and the FV-200PP-AS is ready for operation.

[Rear]



4. DC Power Input Terminal

Connect this terminal to 24 V DC power supply. Power is supplied from the FV-200PS-AS. (M3 screw terminal; barrier distance: 6.4 mm)

5. ALL CALL Terminal

Connect this terminal to the FV-200RF-AS.

6. RF-PP LINK Terminal

Connect this terminal to the FV-200RF-AS. (0 dBV, 600 Ω, balanced, 3P terminal block for audio)

7. RF Input Volume

Adjust the input volume from FV-200RF-AS. Turning the control clockwise increases the volume, while turning it counter clockwise decreases the volume.

8. Paging Input Terminal

Connect audio and control signals from equipment (such as telephone paging equipment) to this terminal. Input signals to this terminal are broadcast when the control terminals are closed.

Audio: -60 dB / -20 dB selectable, 600 Ω, balanced

Control: Open voltage: 24 V DC; short-circuit current: under 2 mA

3P terminal block for audio and 2P terminal block for control

9. Paging Input Sensitivity Selector Switch

Sets the input sensitivity of Paging Input (8) to -60 dB or -20 dB. (Default: -20 dB)

10. Paging Input Volume

Adjust the input volume of Paging Input(8). Turning the control clockwise increases the volume, while turning it counter clockwise decreases the volume.

11. Timer Input Terminal

Connect audio and control signals from timer-operated equipment to this terminal. Input signals to this terminal are broadcast with the highest priority when the control terminals are closed.

Audio: -20 dB, 600 Ω, unbalanced

Control: Open voltage: 24 V DC; short-circuit current: under 2 mA

2P terminal block for audio and 2P terminal block for control

12. Timer Input Volume

Adjust the input volume of Timer Input(11). Turning the control clockwise increases the volume, while turning it counterclockwise decreases the volume.

13. EV Input Terminal

Used to connect the FV-200EV-AS. This input can be used only while an emergency broadcast is being made.

-20 dBV, 600 Ω, unbalanced, 2P terminal block for audio and 2P terminal block for control.

14. EV Input Volume

Adjust the input volume of EV Input(13). Turning the control clockwise increases the volume, while turning it counterclockwise decreases the volume.

15. BGM Output Terminal

Signals from the MIC/LINE Inputs 1~4 and AUX1,2 are mixed and output. Connect this terminal to the power amplifier for BGM broadcast. (0 dB, 600 Ω, balanced, 3P terminal block)

16. Output Mode Selector Switch

Sets the audio output to "CH1" (1-channel) or "CH2" (2-channel) broadcasts. (Default: 1-channel broadcast)

17. Priority Output Terminal
When the Output Mode Selector Switch (16) is set to 2-channel broadcast:
Output signals are from the EV, Timer, Paging, RM Inputs. Connect this terminal to the power amplifier intended for priority broadcast. (0 dB, 600 Ω , balanced, 3P terminal block)
When the Output Mode Selector Switch (16) is set to 1-channel broadcast:
Output signals are from the MIC/LINE1~4, AUX1,2 inputs. If EV, Timer, Paging, RM inputs are activated, MIC/LINE1~4, AUX1, 2 inputs are muted. Connect this terminal to the power amplifier intended for priority broadcast.
18. Auxiliary Input 1,2 Terminal
Connect background music equipment to this terminal. -20 dB, 10 k Ω , unbalanced, 2P RCA jack.
19. MIC/LINE Input 4 Sensitivity Selector Switch
Sets the input sensitivity of MIC/LINE Input 4 (20) to MIC or LINE.
(Default: LINE)
20. MIC/LINE Input 4 Terminal
Connect background music equipment or microphone to this terminal. -60dB / -20 dB selectable, 600 Ω , balanced, 3P terminal block.
21. MIC/LINE Input 3 Sensitivity Selector Switch
Sets the input sensitivity of MIC/LINE Input 3 (22) to MIC or LINE.
(Default: LINE)
22. MIC/LINE Input 3 Terminal
Connect background music equipment or microphone to this terminal. -60dB / -20 dB selectable, 600 Ω , balanced, 3P terminal block.
23. MIC/LINE Input 2 Sensitivity Selector Switch
Sets the input sensitivity of MIC/LINE Input 2 (24) to MIC or LINE.
(Default: LINE)
24. MIC/LINE Input 2 Terminal
Connect background music equipment or microphone to this terminal. -60dB / -20 dB selectable, 600 Ω , balanced, 3P terminal block.
25. MIC/LINE Input 1 Sensitivity Selector Switch
Sets the input sensitivity of MIC/LINE Input 1 (26) to MIC or LINE
(Default: LINE)
26. MIC/LINE Input 1 Terminal
Connect background music equipment or microphone to this terminal -60dB / -20 dB selectable, 600 Ω , balanced, 3P terminal block.
27. Phantom ON/OFF switch
Select whether or not to use the phantom power supply of MIC/LINE input 1.
(Default: OFF)
28. Mute Adjust Volume
MIC/LINE input 1 overrides other MIC/LINE inputs and AUX input with 0~30dB attenuation.
(Default: 0 dB)
29. Functional Earth Terminal
Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-200PP-AS. This could reduce noise.
Note: This terminal is not for protective earth.

Note:
If using unbalanced connection in BGM output terminal and Priority output terminal, connect H and E only and remain C left open.

5.3 FV-200RF-AS Microphone Receiver Panel

The FV-200RF-AS is used to connect the RM-200M to FV-200 Series Emergency Public Address System. Up to 4 RM-200M units can be connected using the FV-200RF-AS. It is possible to control 50 speaker lines as well as all-zone calls.

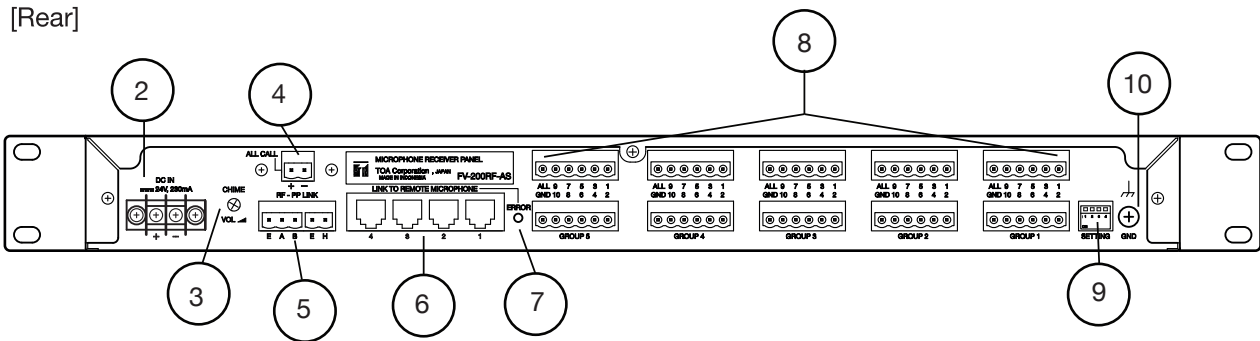
[Front]



1. Power Indicator

Lights when power is supplied and the FV-200RF-AS is ready for operation.

[Rear]



2. DC Power Input Terminal

Connect this terminal to 24 V DC power supply. Power is supplied from the FV-200PS-AS. (M3 screw terminal; barrier distance: 6.4 mm)

3. Chime Volume

Adjust the volume of the built-in 4-tone chime.

4. ALL CALL Terminal

Connect this terminal to the FV-200PP.

5. RF-PP LINK Terminal

Connect this terminal to the FV-200PP. Audio and control signals from the RM-200M are output.

6. RM-200M Link Terminals

The following terminals are available for connection of the RM-200M.

7. Error Indicator

Lights if any failure is detected in communications with the RM-200M.

8. SS Zone Control Terminals

Connect these terminals to the Speaker Selector (SS-2010, SS-1010, SS-1010R), Data of zones selected via the RM-200M is output from these terminals.

9. Function Setting Switch

This switch performs the following settings:

- Number of RM-200M units (SW #3 and #4) Sets the number of RM-200M units to 1 through 4.
- Priorities among RM-200M units (SW #1 and #2) Sets priorities among the RM-200M units to "Last-In-First-Out," "First-In-First-Out," or Individual. (Default: "Last-In-First-Out," "1 unit")

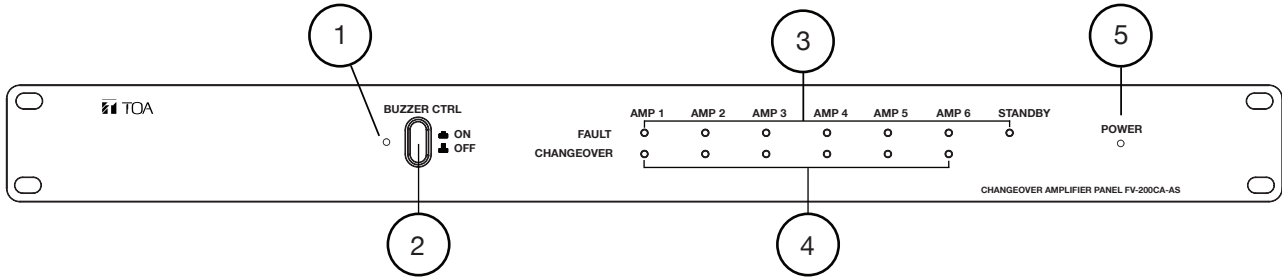
10. Functional Earth Terminal

Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-200RF-AS. This could reduce noise. Note: This terminal is not for protective earth.

5.4 FV-200CA-AS Changeover Amplifier Panel

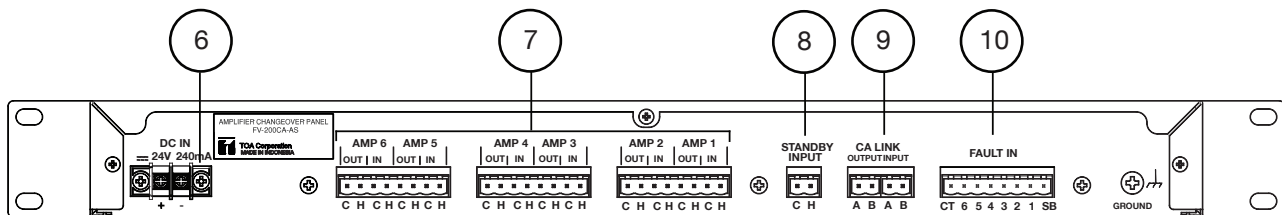
The FV-200CA-AS Amplifier Changeover Panel is used to automatically changeover fault FV-200 series duty amplifier to working standby amplifier. Can handle up to six FV-200 series amplifier (FV-224PA-AS, FV-248PA-AS). Amplifier with lower number have higher changeover priority. Cascade connection make connection with more six duty amplifier with only one standby amplifier possible.

[Front]



1. Buzzer CTRL Indicator
Will light red when Buzzer CTRL switch pull off or buzzer is being muted.
2. Buzzer CTRL Switch
When push on buzzer will sound when there is any fault in amplifier. When pull off buzzer will muted even there is a fault in duty or standby amplifier.
3. Fault Indicator
Light red when corresponding amplifier fault.
4. Changeover Indicator
Light orange when corresponding amplifier fault and changeover to standby amplifier.
5. Power Indicator
Will light green when 24V DC is supplied from power supply.

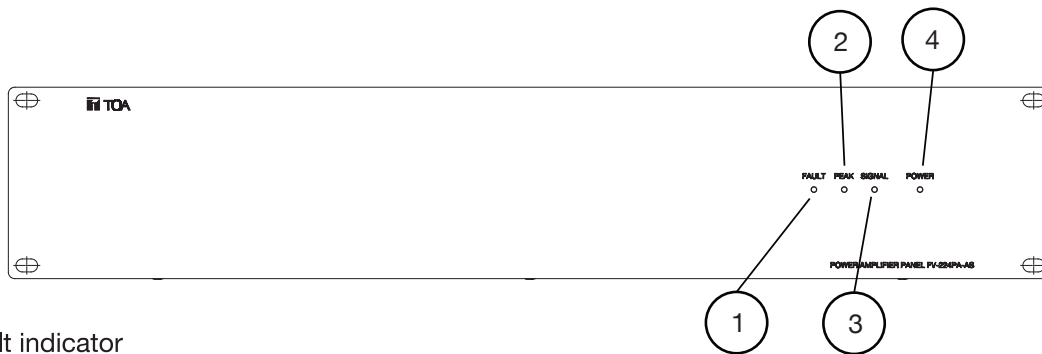
[Rear]



6. DC Power Input Terminal
Connect this terminal to 24V DC power supply. Power is supplied from the FV-200PS-AS. (M3 screw terminal; barrier distance: 6.4 mm)
7. Duty Amplifier Audio Terminal
Connect audio output from each duty amplifier to each IN audio terminal, connect each OUT to speaker selector audio IN or directly into speaker.
8. Standby Amplifier Audio Terminal
Connect audio output from standby amplifier to here.
9. CA LINK Terminal
In cascade connection connect higher priority FV-200CA CA LINK OUTPUT into CA LINK INPUT, connect CA LINK OUTPUT into lower priority FV-200CA CA LINK INPUT.
10. FAULT IN
Connect CT to each duty amplifier FV-224PA-AS, FV-248PA-AS middle pin of FAULT OUT. Connect "6" to duty amplifier no 6 right pin of FAULT OUT, "5" to amplifier no 5, "4" to amplifier no 4 and so forth, SB is to connect to Standby amplifier.

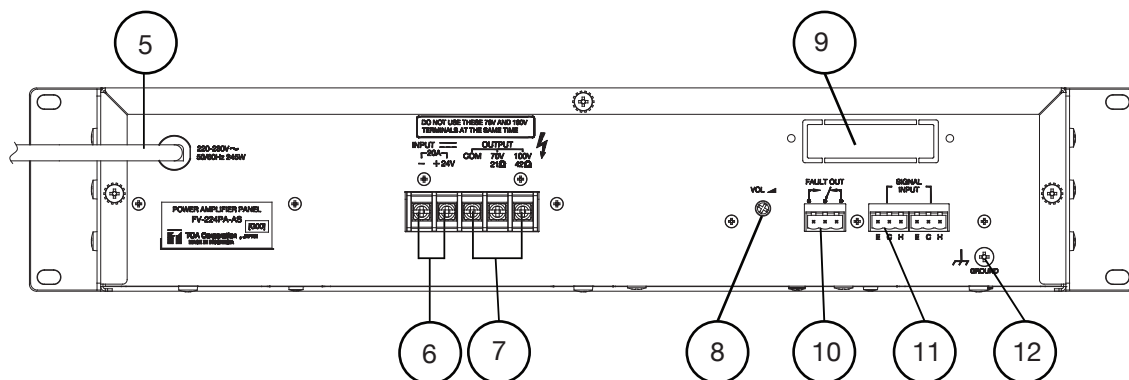
5.5 FV-224PA-AS 240W Power Amplifier Panel

[Front]



1. Fault indicator
Lights red when a failure occurs the unit.
Lights when :
 - Power off (for a few seconds)
 - Overheat
 - Fuse broken
 - Short circuit
2. Peak Indicator
Lights red to indicate the output signal reaches the peak level, this indicates that sound is distorted. In such a case, adjust each volume control to reduce input level.
3. Signal Indicator
Lights green when power is supplied and indicates an input signal.
4. Power Indicator
Lights green when power is supplied.

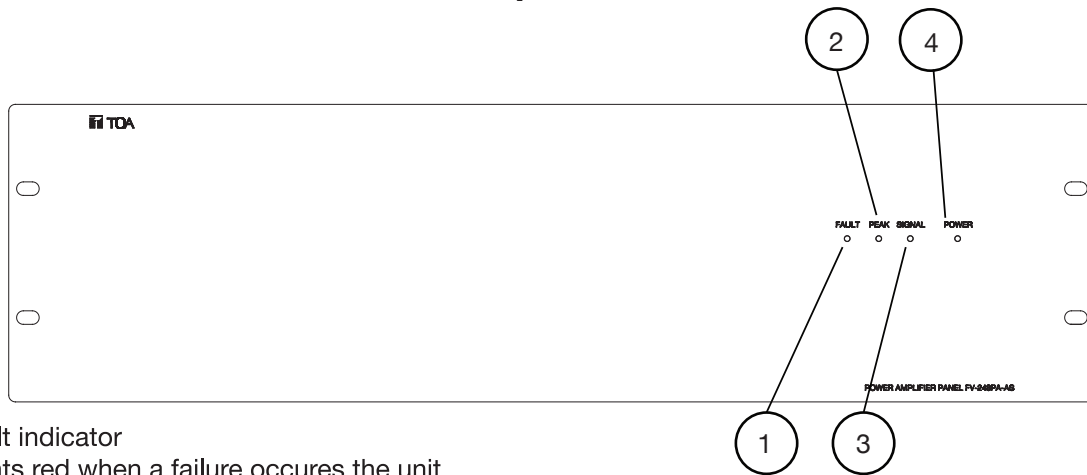
[Rear]



5. AC Power Cord
Connects to an AC power source.
6. DC Terminal
Connects to a DC power supply of 24V.
7. Output Terminal
Connect to speakers. When connecting speakers use only one of the speaker output terminals high impedance.
8. Input Volume Control
Adjusts the input volumel.
9. Module Slot
Insert the VP-200VX Power Amplifier Input modules into this slot.
10. Fault Output Terminal
Contact outputs when failure occurs in amplifier.
11. Input Terminal
Connect this terminal to the FV-200PP-AS Priority Output and BGM Output.
12. Functional Earth Terminal
Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-224PA-AS. This could reduce noise.
Note: This terminal is not for protective earth.

5.6 FV-248PA-AS 480W Power Amplifier Panel

[Front]



1. Fault indicator

Lights red when a failure occurs the unit.

Lights when :

- Power off (for a few seconds)
- Overheat
- Fuse broken
- Short circuit

2. Peak Indicator

Lights red to indicate the output signal reaches the peak level, this indicates that sound is distorted. In such a case, adjust each volume control to reduce input level.

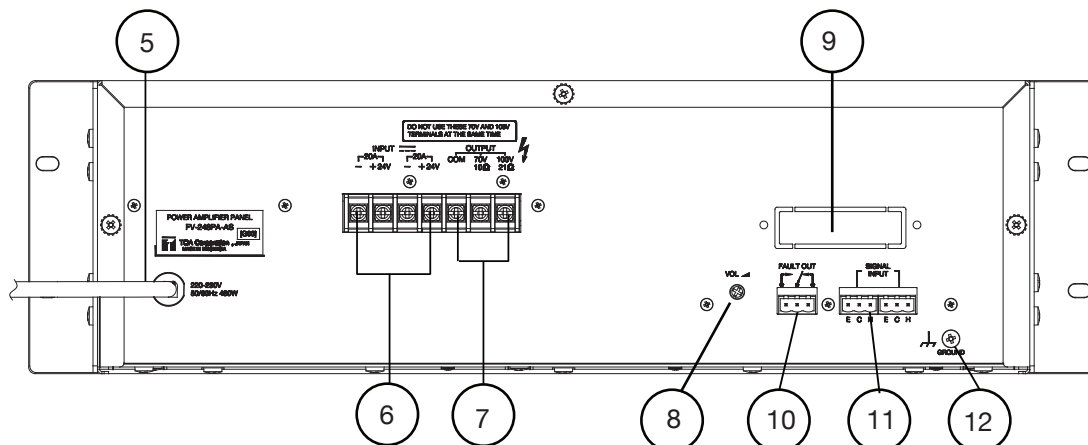
3. Signal Indicator

Lights green when power is supplied and indicates an input signal.

4. Power Indicator

Lights green when power is supplied.

[Rear]



5. AC Power Cord

Connects to an AC power source.

6. DC Terminal

Connects to a DC power supply of 24V.

7. Output Terminal

Connect to speakers. When connecting speakers use only one of the speaker output terminals high impedance.

8. Input Volume Control

Adjusts the input volume.

9. Module Slot

Insert the VP-200VX Power Amplifier Input modules into this slot.

10. Fault Output Terminal

Contact outputs when failure occurs in amplifier.

11. Input Terminal

Connect this terminal to the FV-200PP-AS Priority Output and BGM Output.

12. Functional Earth Terminal

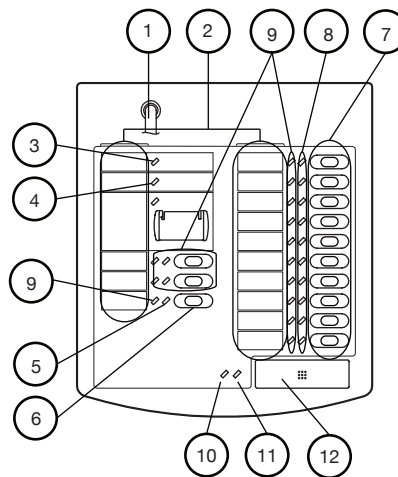
Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-248PA-AS. This could reduce noise.

Note: This terminal is not for protective earth.

5.7 RM-200M Remote Microphone

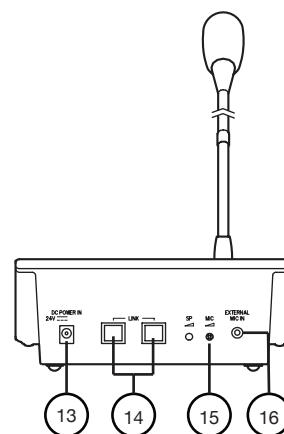
[Top]

1. Gooseneck microphone
A unidirectional microphone.
2. Name label
Insert the label (not thicker than 0.2 mm) indicating the name of each panel control and indicator.
3. Power indicator (POWER)
Lights green when the power is supplied to the unit.
4. Fault indicator (FAULT)
Flashes yellow when a communications failure occurs between the unit and the FV-200RF-AS.



[Rear]

5. All-zone indicator (ALL-ZONE)
Lights green when the All-Zone Broadcast is selected with the key.
6. All-zone broadcast key (ALL-ZONE)
Press this key to make the All-Zone Broadcast.
7. Zone selector key (ZONE 1 ~ 10)
Selects the desired broadcast zones (Zones 1 ~ 10).
8. Zone indicator (ZONE 1 ~ 10)
Lights green when the corresponding broadcast zone (Zones 1 ~ 10) is selected.



9. Not use.
10. Busy indicator (BUSY)
Flashes orange when other priority broadcast is performed
Orange: other priority broadcast is performed
Unlit : other priority broadcast is not performed

16. External microphone input jack [EXTERNAL MIC IN]
A 3.5 mm-diameter Mini-jack. Connects a electronic condenser microphone (ex. headset). Inserting a Mini-plug switches the microphone sound source to that which is connected to this jack.

11. In-use indicator (IN-USE)
Lights green when the RM-200M is in use.

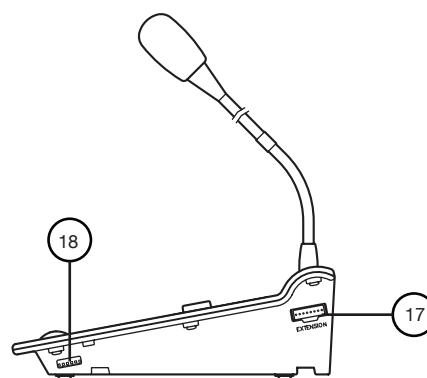
[Right Side]

12. Talk key (TALK)
This key is used for general broadcast microphone announcements. Pressing the Talk key after zone selection allows microphone announcements to be broadcast over the selected zone(s).

13. DC power input jack [DC POWER IN]

14. Link connector [LINK]
A female RJ45 connector. Connects the FV-200RF or other RM-200M units (up to 4 units connectable per system) using the cable of Category 5 STP straight type.

15. Microphone volume control [MIC]
Adjusts the volume of the unit's gooseneck microphone or the external microphone input (No. 16).

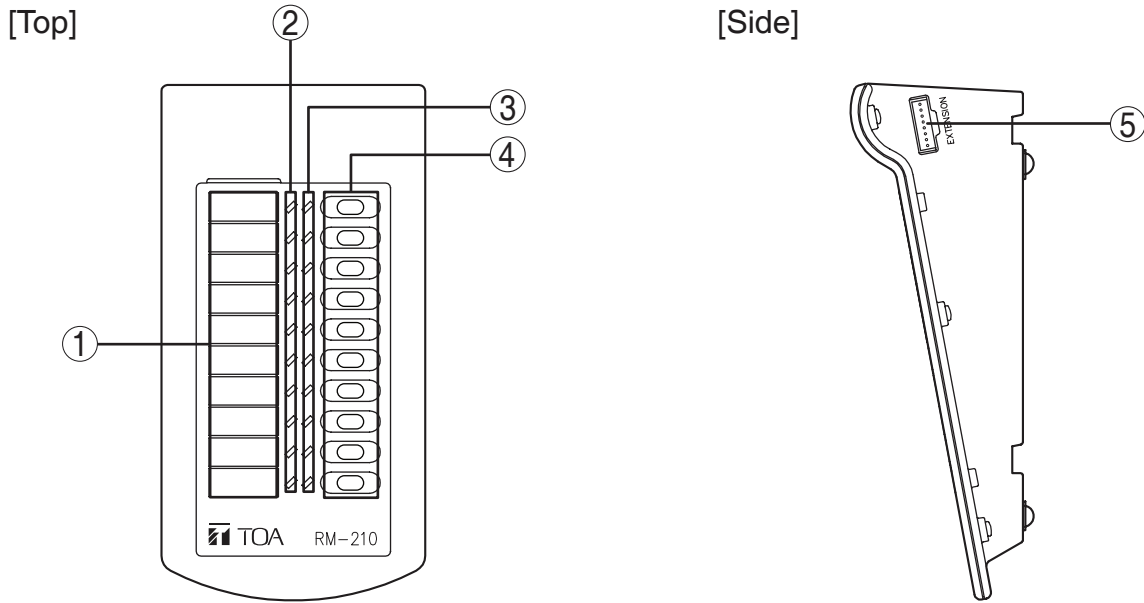


17. Extension connector [EXTENSION]
Connects the RM-210 Remote Microphone Extension using the cable supplied to the RM-210.

18. Function setting switch
Used for setting the Remote Microphone's Unit numbers (1 ~ 4) and functions as shown in the 8.2 REMOTE MICROPHONE SETTINGS

5.8 RM-210 Remote Microphone Extension

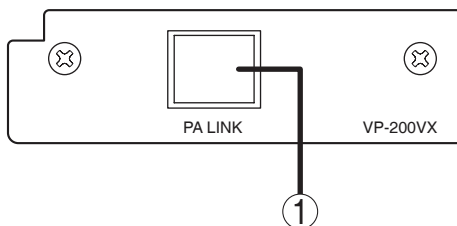
The RM-210 is an expansion unit for the RM-200M Remote Microphone. Up to 4 Expansion Units can be added, expanding the available zone selection keys to up to 10 per unit. Only the right-side indicators are used.



1. Name label
Insert the label (not thicker than 0.2 mm) indicating the name of each panel control and indicator.
2. Not used.
3. Zone indicator (ZONE 1 ~ 10)
Lights green when the corresponding broadcast zone (Zones 1 ~ 10) is selected.
4. Zone selector key (ZONE 1 ~ 10)
Selects the desired broadcast zones (Zones 1 ~ 10).
5. Connector [Extension]
Connect the RM-200M Remote Microphone or additional RM-210 Remote Microphone Extension to this connector. The same terminal is provided on the other side as well.

5.9 VP-200VX Power Amplifier Input Module

Insert this module into the Power Amplifier's Input module slot when in use.



1. Input Connector [PA LINK]
This RJ45 connector connects to the SX-2100AO's PA LINK (ZONE 1 ~ 8, STANDBY) connector or VX-200SP module's or VX-200SZ module's PA LINK connector.
Output audio signals are transmitted to the power amplifier, and the power amplifier's audio monitor signals are returned to the module. It is also possible to retrieve data regarding power amplifier overheating status and blown DC fuses.

5.10 FV-200PS Power Supply Panel

The FV-200PS-AS supplies 24 V DC power to each unit used in FV-200 series Emergency Public Address System. Put power supply as far as can from FV-200PP-AS to prevent unexpected noise, is best to put at the bottom of cabinet rack.

[Front]



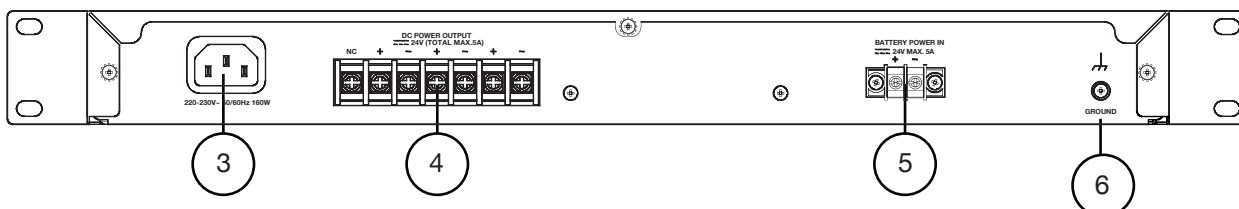
1. AC Power Indicator

Lights green when AC power is supplied and the FV-200PS-AS is ready for operation on AC power.

2. DC Power Indicator

Lights orange when DC power is supplied and the FV-200PS-AS is ready for operation on DC power.

[Rear]



3. AC Power Inlet

Connect the supplied power cord to this inlet.

4. 24V DC Output Terminal

Connect this terminal to the 24 V DC input of each system unit. Current capacity: 5 A (total). (M4 screw terminal; barrier distance: 12 mm)

5. Battery Power In Terminal

Connect to battery or Emergency Power Supply panel. (M3 screw terminal; barrier distance: 6.4 mm)

6. Function Earth Terminal

Connect this terminal to the functional earth terminal of external equipment if excessive noise is generated when the external equipment is connected to the FV-200PS. This could reduce noise.

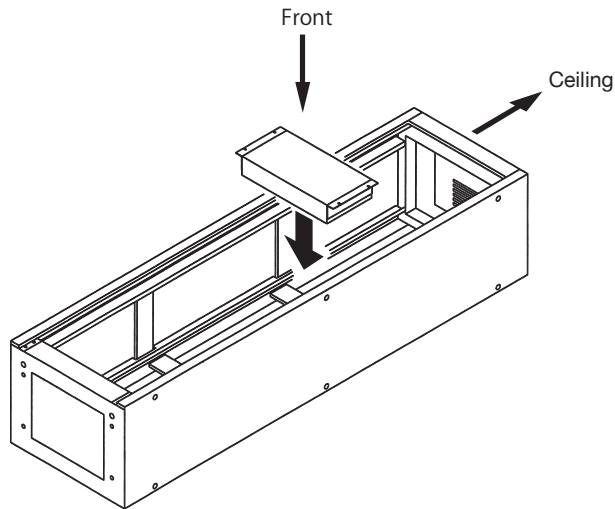
Note: This terminal is not for protective earth.

6. INSTALLATION

6.1. Panels Installation

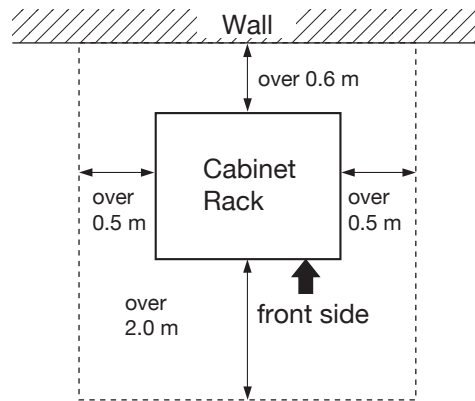
6.1.1. Installation on the Cabinet Rack

The assembly work of the cabinet rack, please assemble according to the instructions attached to cabinet rack. The installation work of each panel to the cabinet rack, can work safely and easily, if put upward the front of the rack as shown in the figure on the below.



6.1.2. Cabinet Rack Installation

In order to facilitate maintenance, please install as shown below as possible.



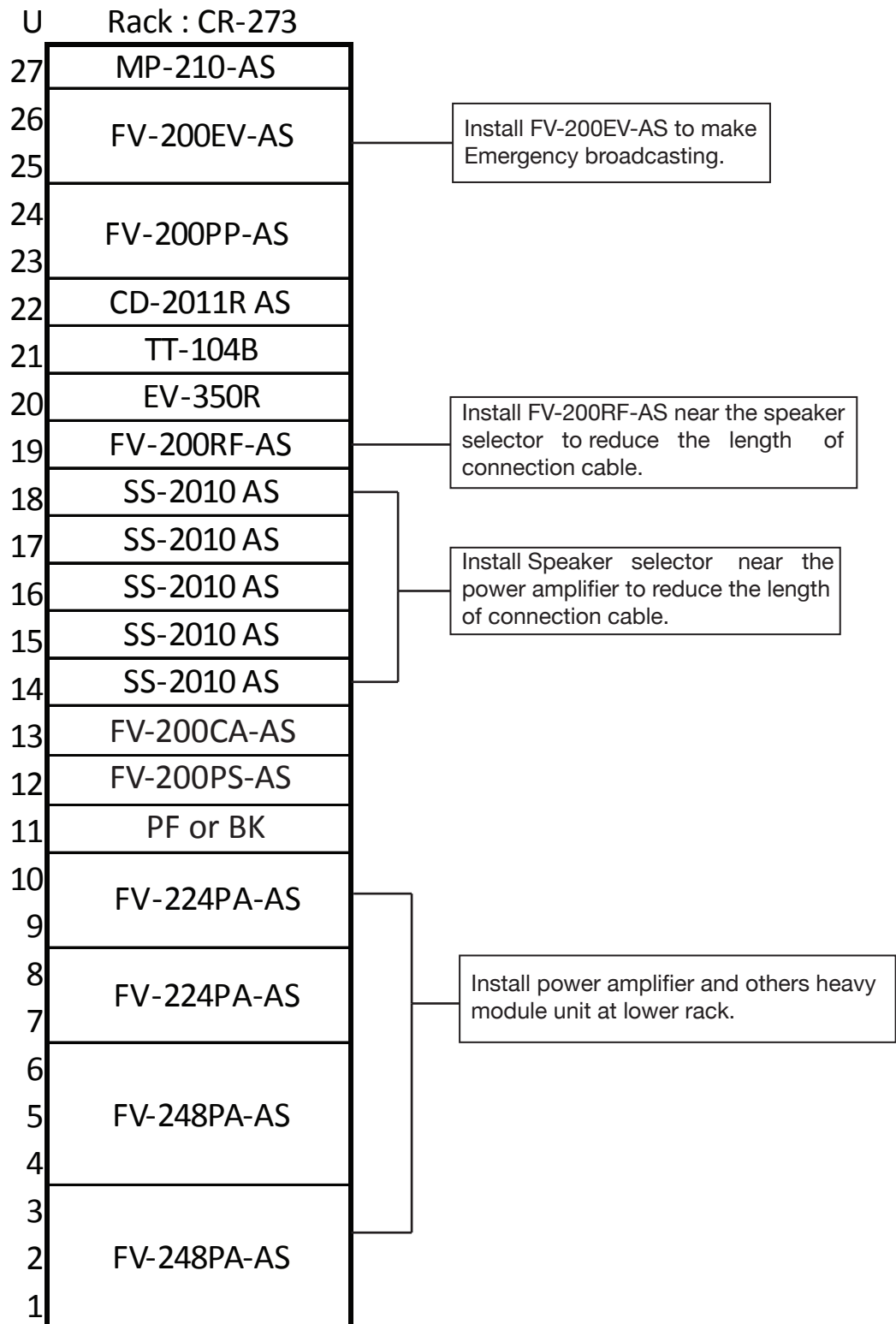
Warning

Please be fixed with metal fittings to the wall to prevent falling due to earthquake with anchor bolts to the floor.

Installation of the rack cabinet to the following places, please avoid.

- *At ambient temperatures of below 0.
- *a place exposed to fire, heat, direct sunlight.
- *where it is easy to take rainwater and water vapor, where there is a lot of moisture.
- *where there is a lot of vibration.
- *where the rear surface of the rack, can not take the space a worker put.
- *Excessive metal powder, dust, where the oil and chemicals and is located near.
- *near high-voltage equipment, peripheral equipment sensitive field.

6.1.3. Installation Example



6.2. Installing the RM-200M

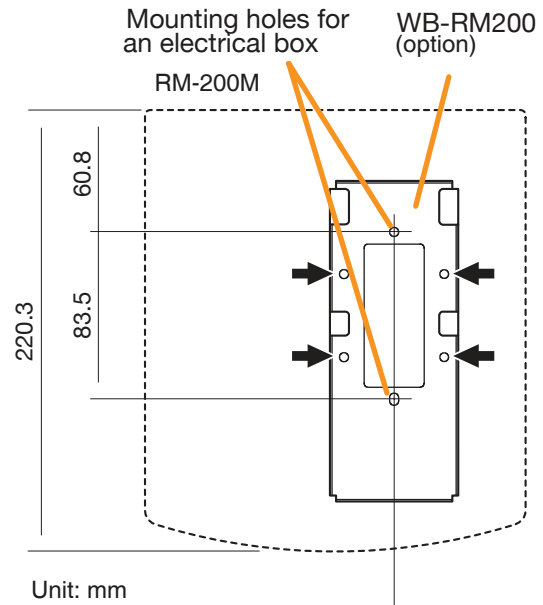
6.2.1. Installing RM-200M on the Wall

To mount the RM-200M on the wall, the following parts are required.

- WB-RM200 Wall Mounting Bracket for the RM-210..... 1 (option)
- Machine screw M3.5 x 20 (for an electrical box mounting) 2 (supplied with the WB-RM200)
- Tapping screw 4 x 25 (for direct wall mounting)..... 2 (supplied with the WB-RM200)

Step 1. Install the optional WB-RM200 bracket on the wall. Pull out the link cable through the bracket's notch. As 2 types of supplied screws are available for electrical box mounting and direct wall mounting, use appropriate ones for mounting method.

[Positional dimensions of the WB-RM200]

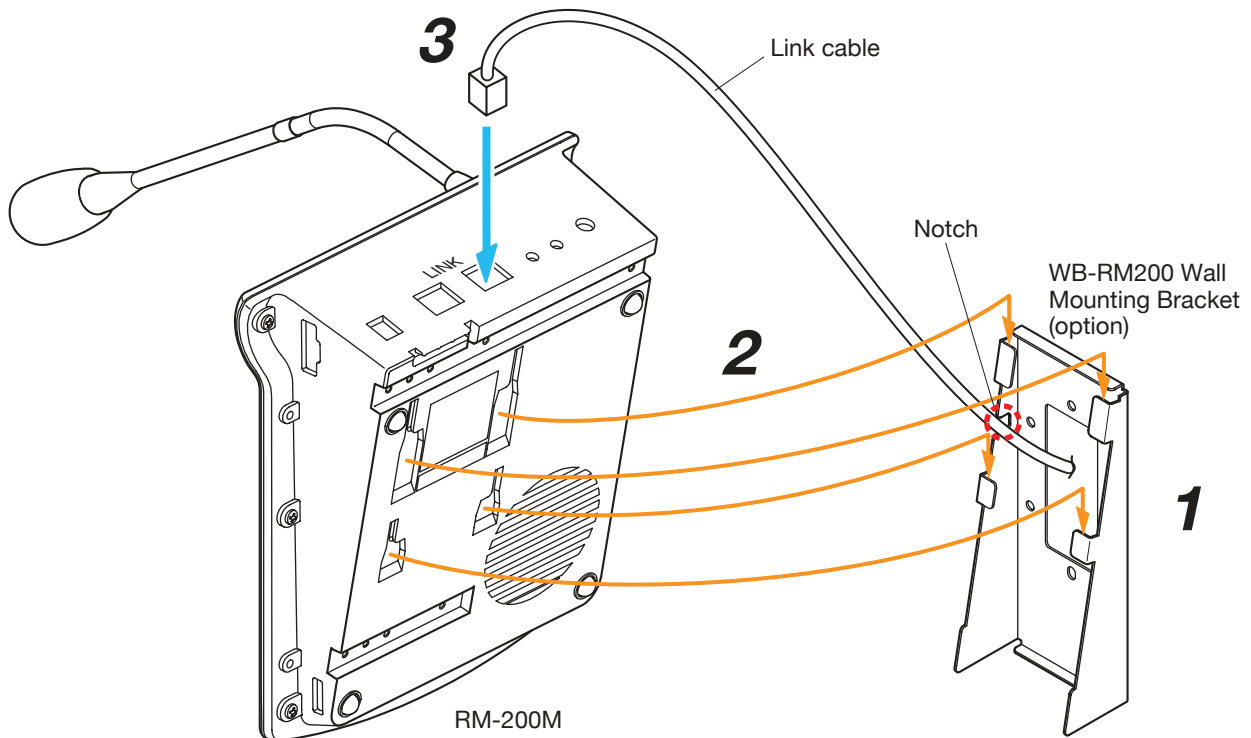


Use 4 mounting holes indicated by arrows to secure the WB-RM200 to the wall

! WARNING

- Install the RM-200M only in a location that can structurally support the weight of the unit and the WB-RM200 bracket. Doing otherwise may result in the unit falling down and causing personal injury and/or property damage.
- Use 2 or more screws to fix the WB-RM200 to the wall.

Step 2. Hook the RM-200M bottom onto the WB-RM200.
 Step 3. Connect the link cable to the RM-200M link connector.



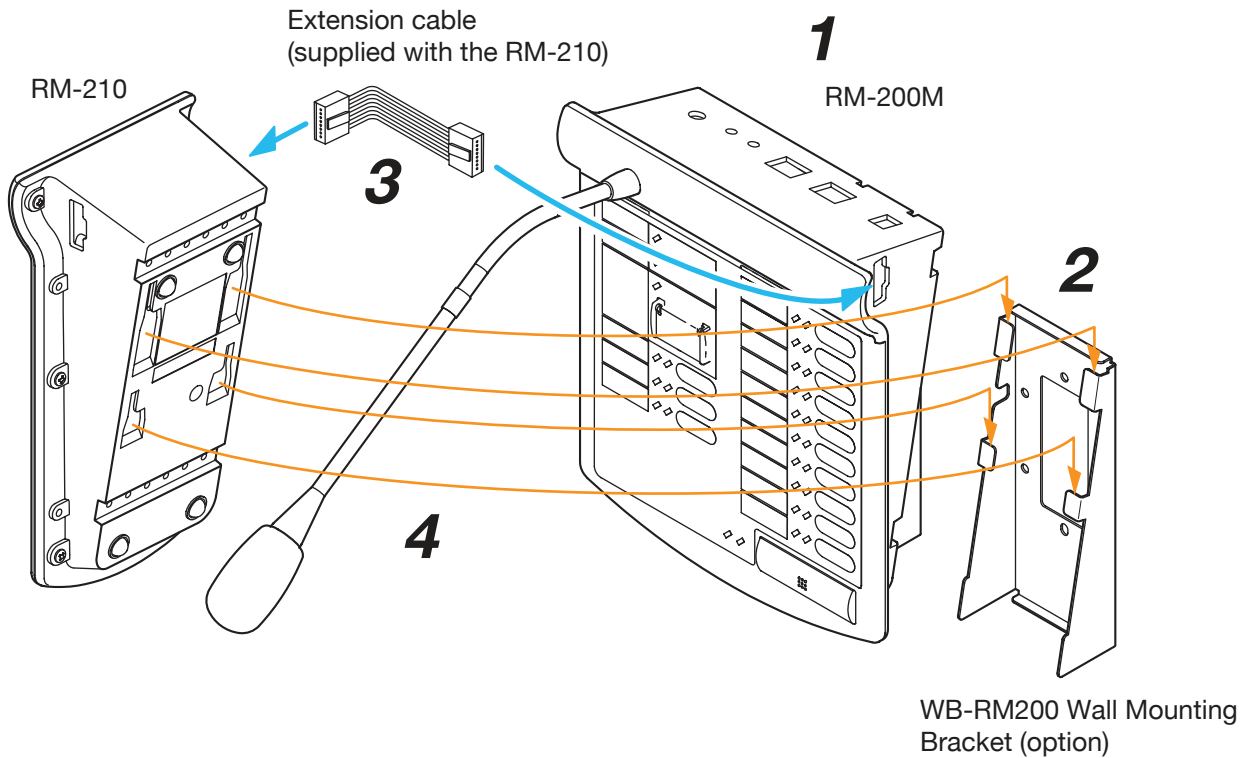
Installing the RM-210 on a Wall

Step 1. Install the RM-200M on the wall. (Refer to "Installing the RM-200M on a Wall" on page 22.)

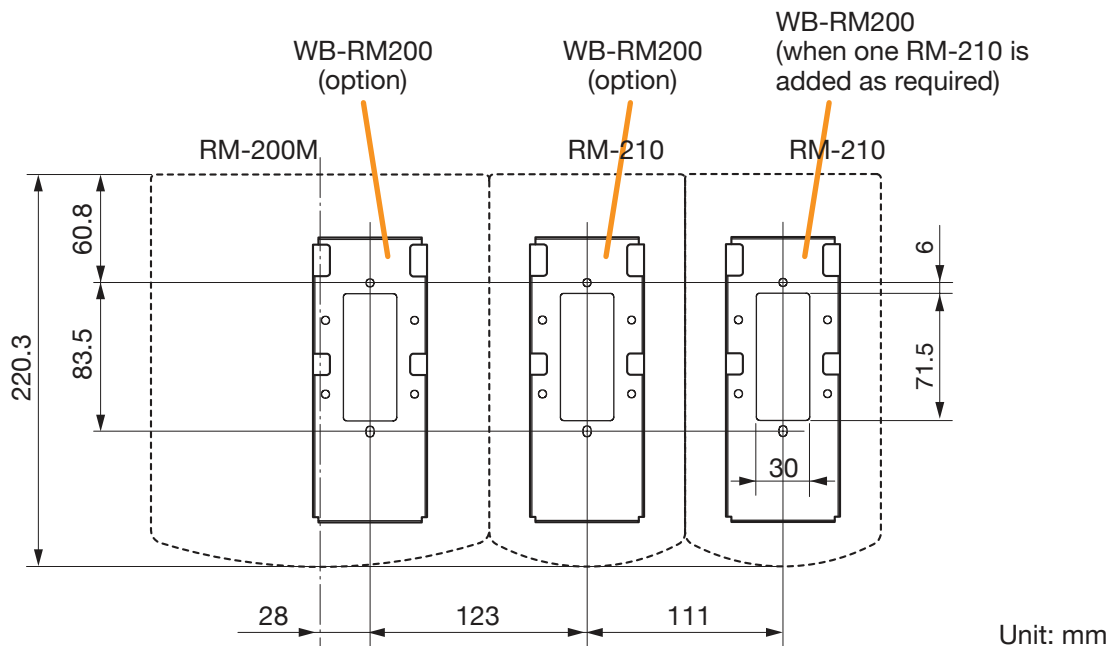
Step 2. Install the WB-RM200 used for the RM-210 mounting on the wall.

Step 3. Connect the extension cable supplied with the RM-210 between both extension connectors on the RM-200M's side and the RM-210's side.

Step 4. Hook the RM-210's bottom onto the WB-RM200.



[Positional dimensions of the WB-RM200s]



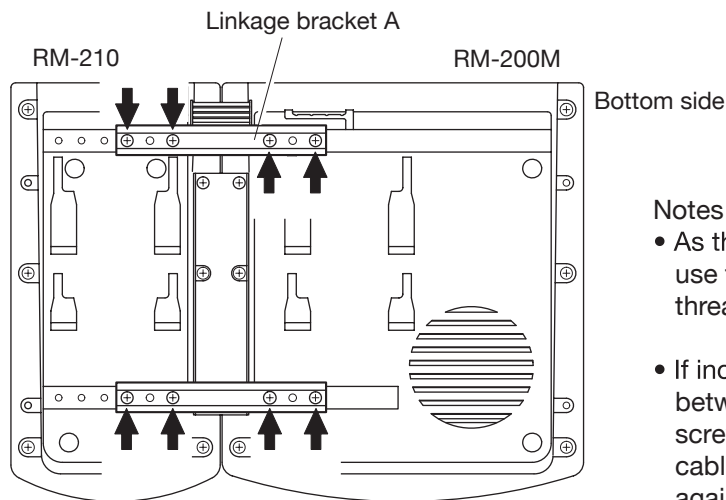
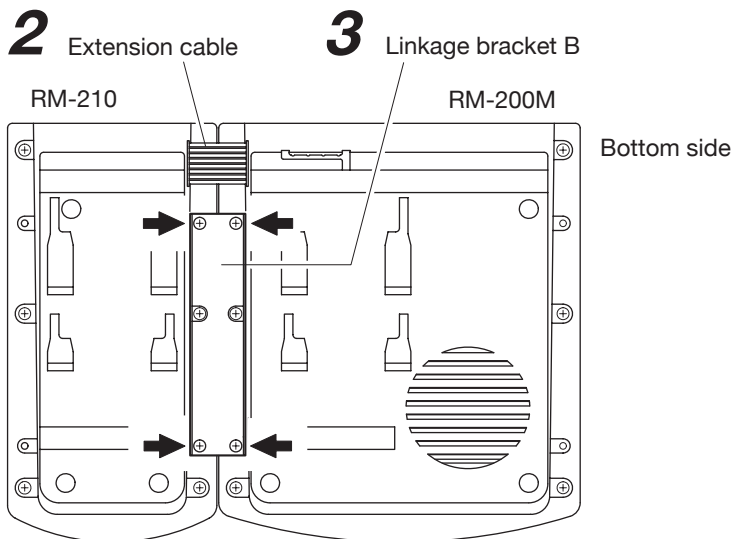
6.2.3. Linking the RM-200M with the RM-210 (For Desktop Mounting)

To expand the RM-200M by adding the RM-210 Remote Microphone Extension unit, use the parts supplied with the RM-210 shown below to link the 2 units. Complete the DIP switch settings in advance, then follow the procedure below to link both units.

- Linkage Bracket A..... 2 (supplied with the RM-210)
- Linkage Bracket B..... 1 (supplied with the RM-210)
- Tapping screw 3 x 8..... 12 (supplied with the RM-210)
- Extension cable..... 1 (supplied with the RM-210)

- Step 1. Turn over both the RM-200M and the RM-210, and keep them in close contact with each other.
- Step 2. Connect the extension cable supplied with the RM-210 between both extension connectors on the RM-200M side and the RM-210 side.
- Step 3. Using the Linkage Bracket B and 4 screws (indicated by arrows in the figure) supplied with the RM-210, link both units together.
- Step 4. Using the 2 Linkage Brackets A and 8 screws (indicated by arrows in the figure) supplied with the RM-210, fix both units securely.

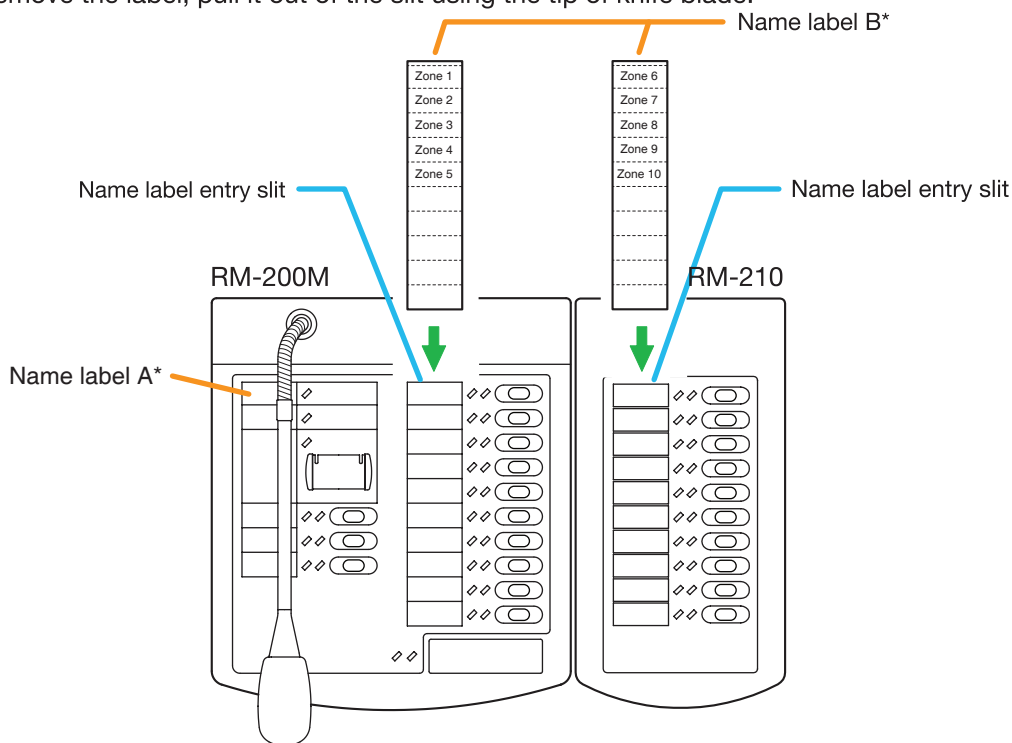
Note
Use the same steps above when another RM-210 is added.



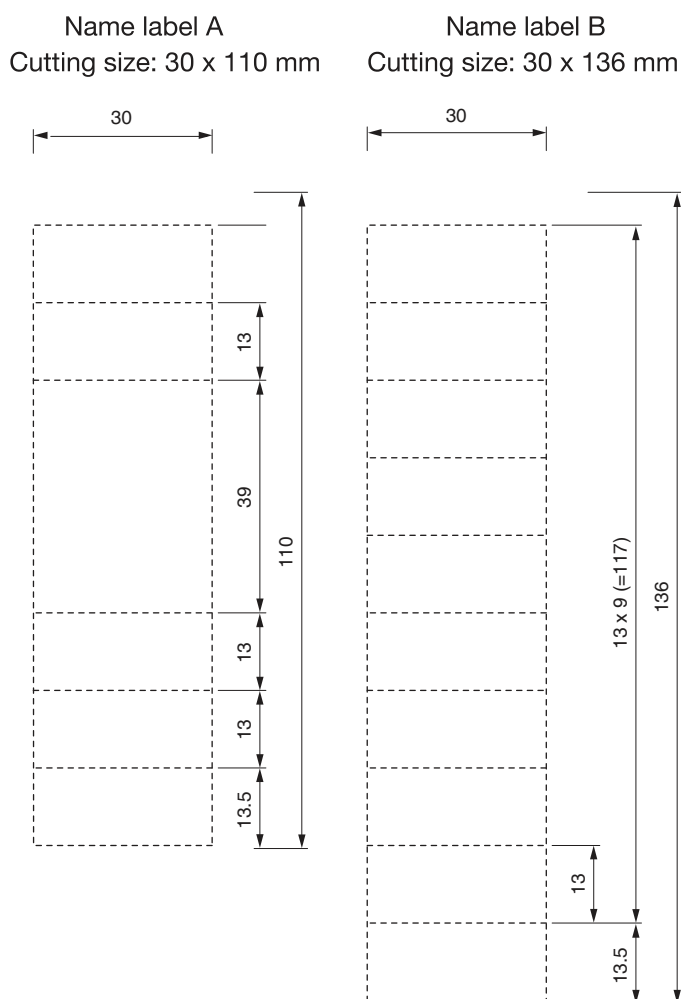
- Notes**
- As the Linkage Bracket A has 2 spare screw holes, use them to link both units if the designated screw threaded holes are damaged.
 - If incorrect or loose cable connection is found between both units, remove all the bracket fixing screws to disassemble the units and reconnect the cable connection correctly. Then, link the units again with the screws.

6.2.4. Inserting the name label

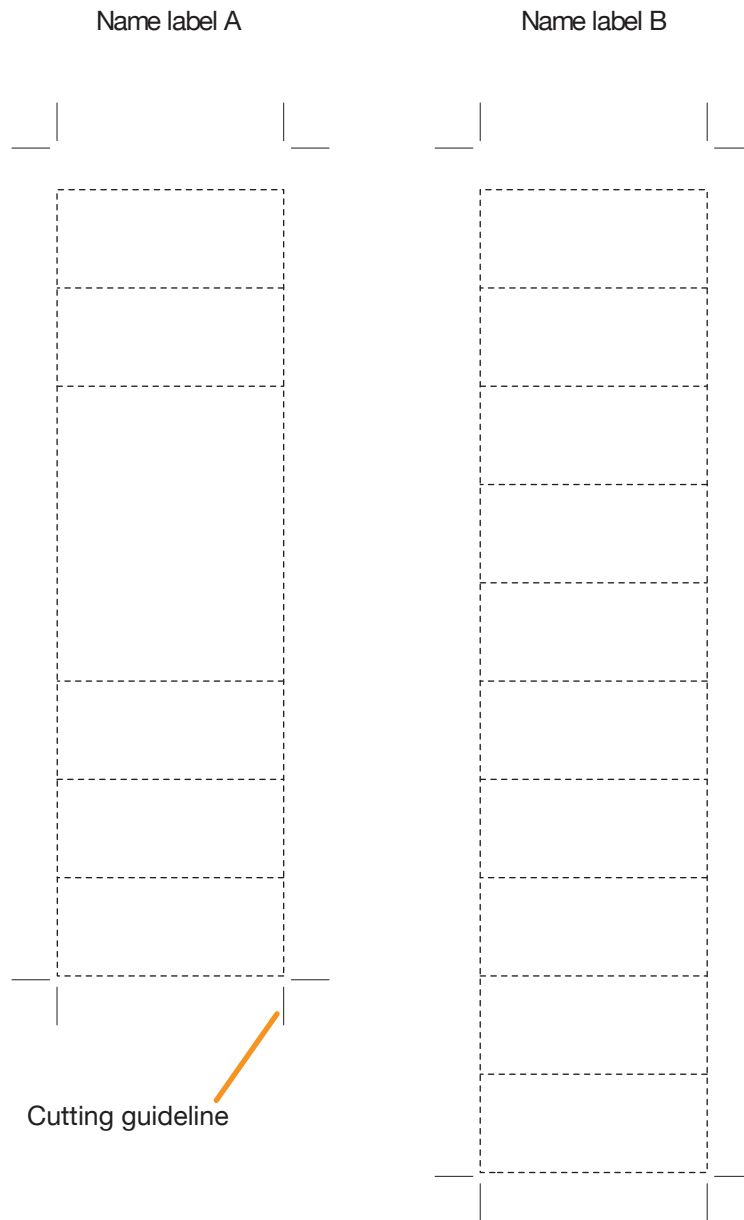
- Fully insert the name label cut to the instructed size into the label entry slit.
- To remove the label, pull it out of the slit using the tip of knife blade.



6.2.5. Dimensional diagram for printing devices



6.2.6. Pattern paper for hand writing



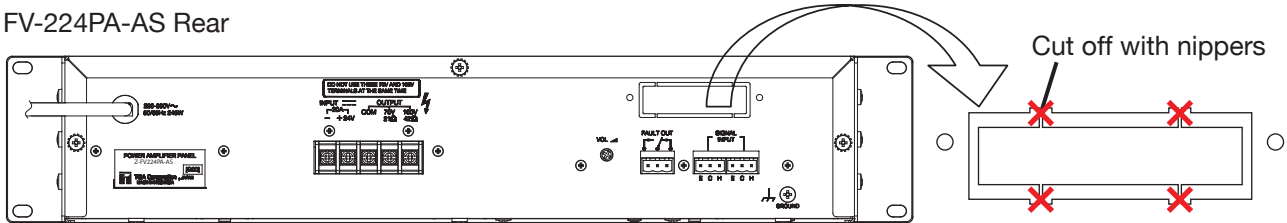
Shown in actual size

6.3 Installing the VP-200VX Power Amplifier Input Module in the Power Amplifiers

Step 1. Remove the top panel.

Step 2. Using nippers, clip out 4 connecting sections and the plate over the VP-200VX mounting location on the power amplifier's rear panel.

FV-224PA-AS Rear



Step 3. Unscrew the VP-200VX's panel.

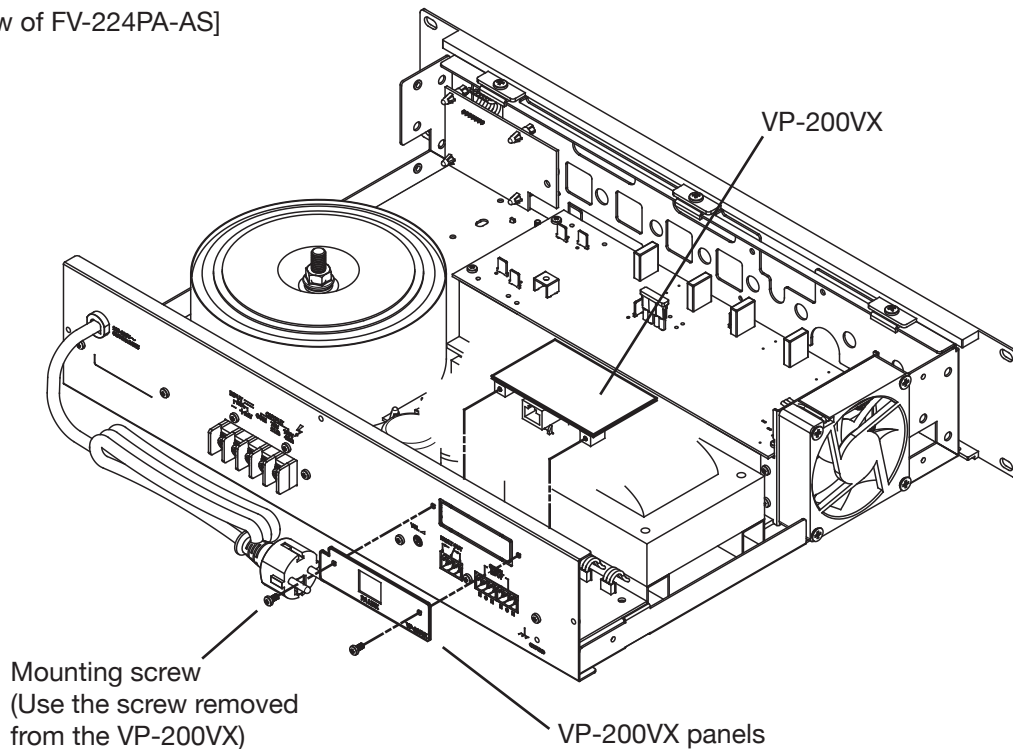
Step 4. Mount the VP-200VX module.

Attach the VP-200VX 's panel to the mounting location and the VP-200VX unit to the back of the mounting location, then secure them to the amplifier using the screws removed in Step. 3.

Notes

- Mount the VP-200VX with its circuit board components faced down.

[Isometric view of FV-224PA-AS]



Step 5. Plug the VP-200VX's connector into the connector on the circuit board inside the amplifier.

Step 6. After mounting is completed for all required channels, replace the top panel.

6.4 Ground lifting using the VP-200VX Power Amplifier Input Module

When operating the system, hum noise may be generated by a ground loop accidentally created in the system. The ground loop can be cut off with the Ground Lift jumper connector setting on the VP-200VX board.

WARNING

To access the Ground Lift jumper connector, take out the internal VP-200VX from the amplifier. Make sure that the system power is switched OFF before starting the work.

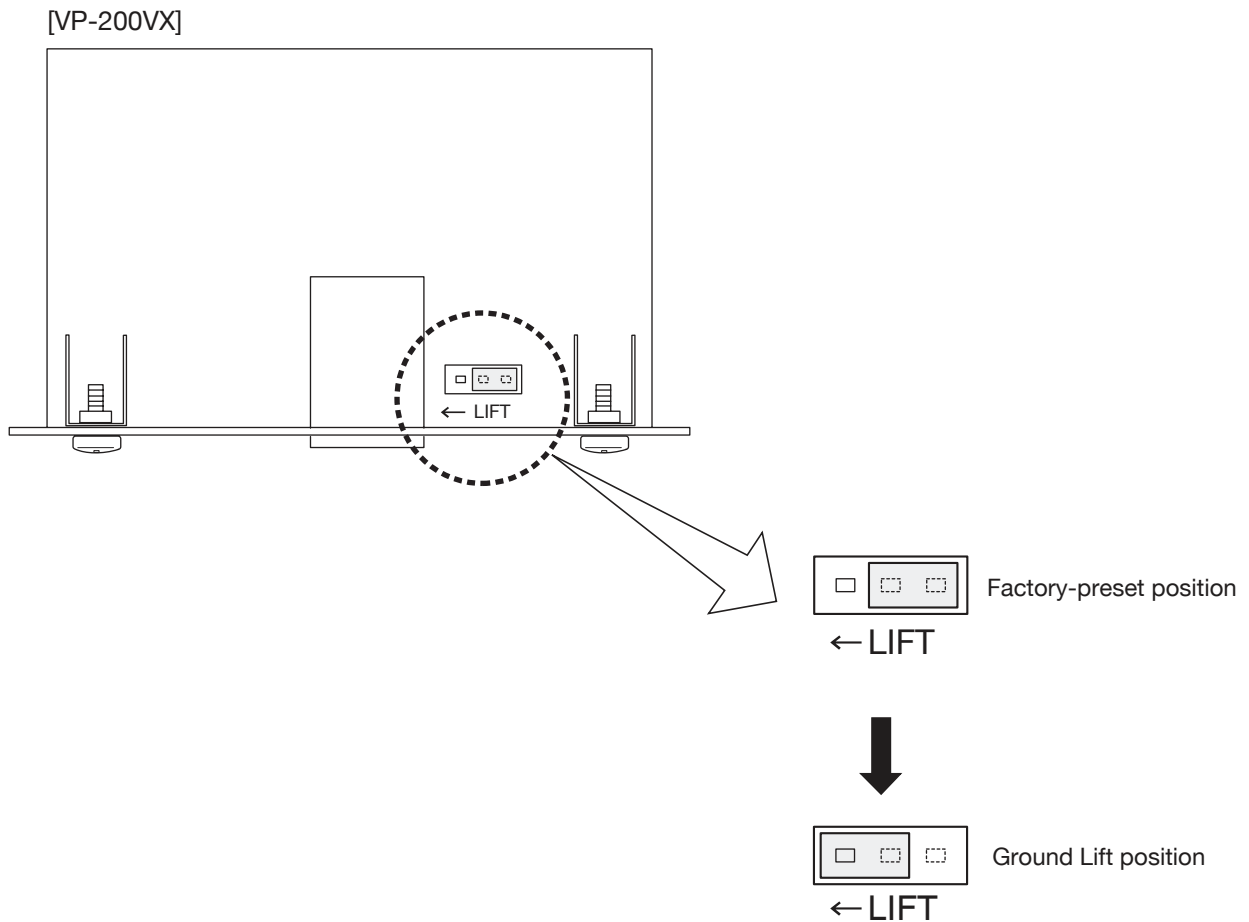
Step 1. Remove the Amplifier's top panel.

Step 2. Take out the VP-200VX.

Step 3. Unplug the jumper socket and plug it to the LIFT position on the VP-200VX board as shown below.

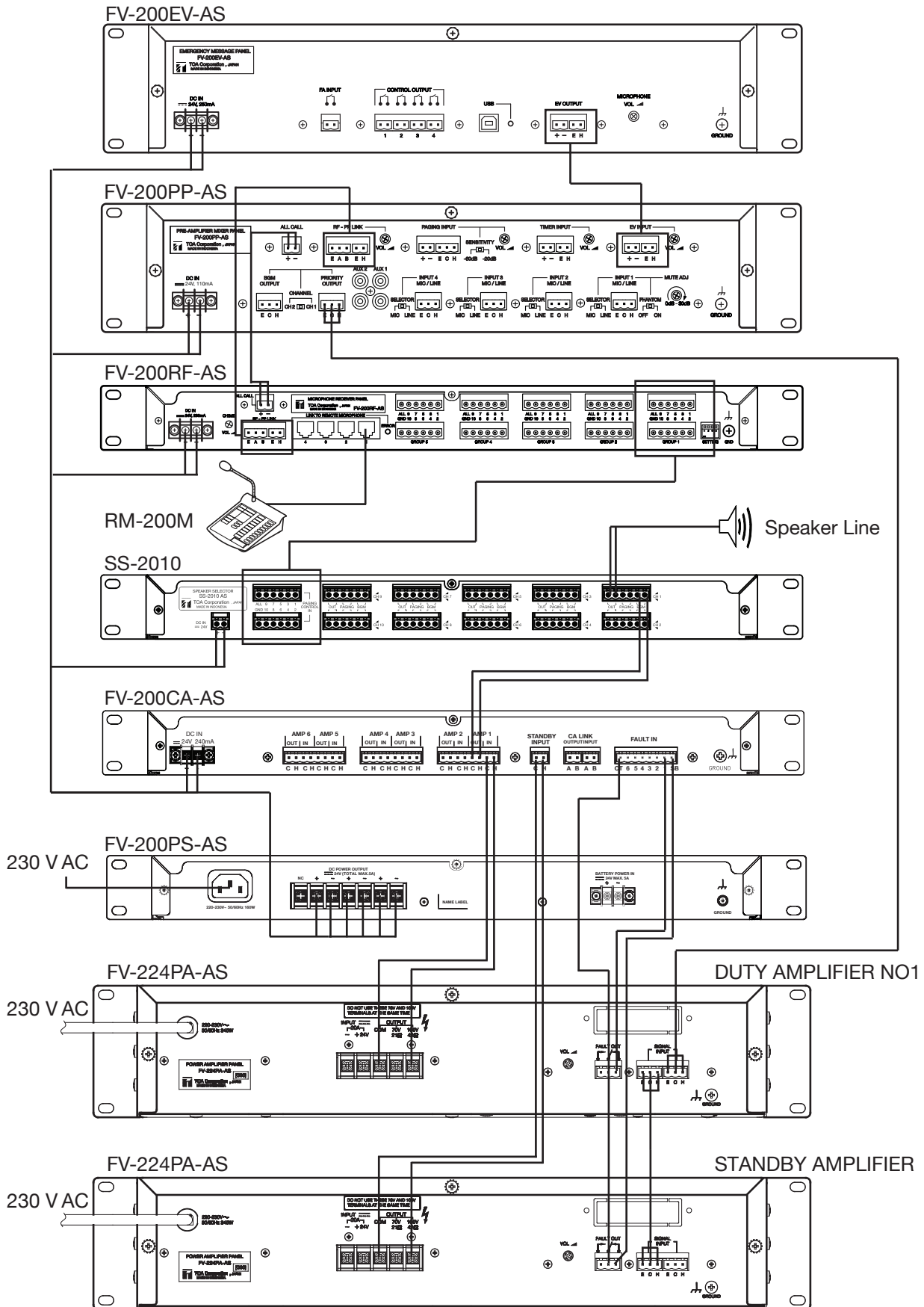
Step 4. Fit the VP-200VX back into place.

Step 5. Replace the top panel.



7. CONNECTIONS

7.1 Basic System Configuration



7.2 24 V DC Power Supply Expansion

If the addition of zones causes the total of current consumption of 24 V DC-operated equipment to exceed 5A, then add the required number of the FV-200PS panels.

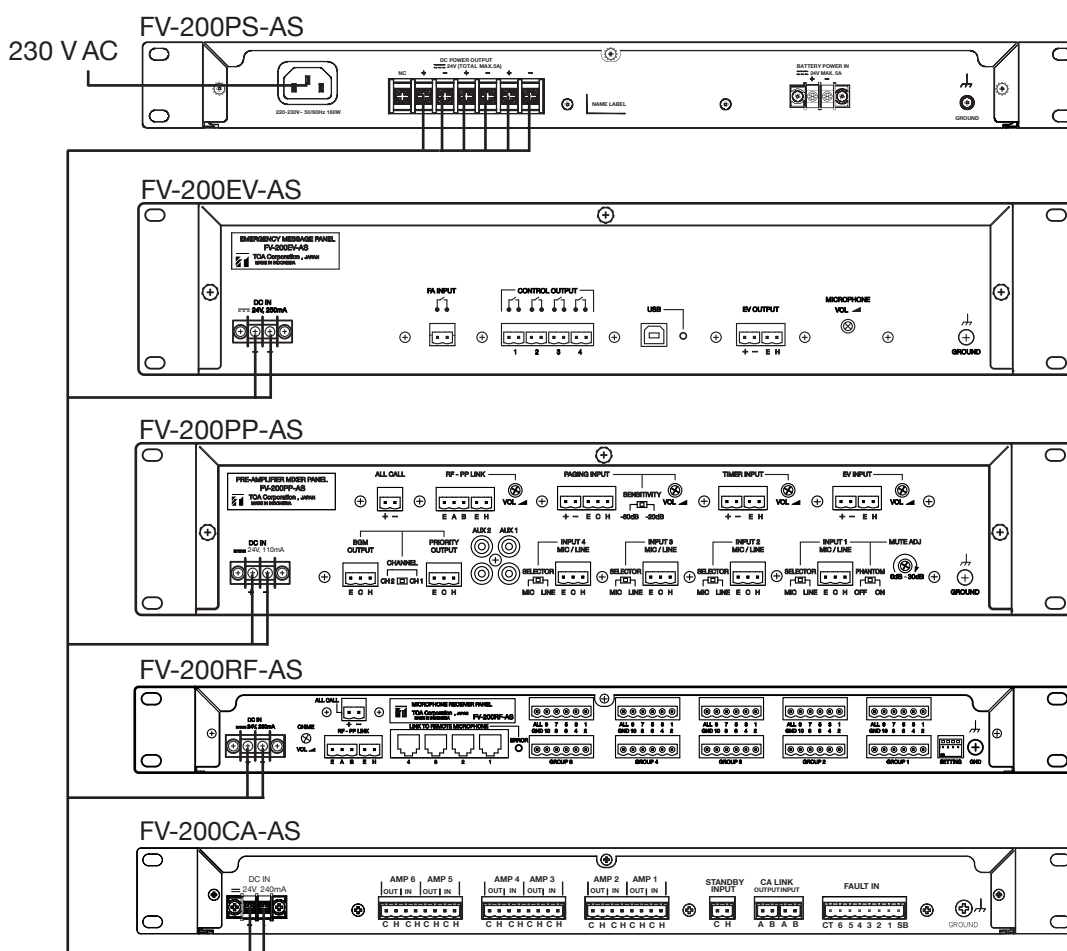
[Notes]

- Make connections between negative (-) terminals of the 24 V DC output of all FV-200PS-AS panel.
- Divide the power supply to 24 V DC-operated equipment in order to keep the current supplied from a single FV-200PS-AS panel at 5A or less. (Refer to the following table showing each component's current consumption at 24 V DC.)

Equipment	Current Consumption
FV-200EV-AS	250 mA
FV-200PP-AS	110 mA
FV-200RF-AS	230 mA
FV-200CA-AS	240 mA
RM-200M	100 mA
RM-210	80 mA

[Wiring Diagram]

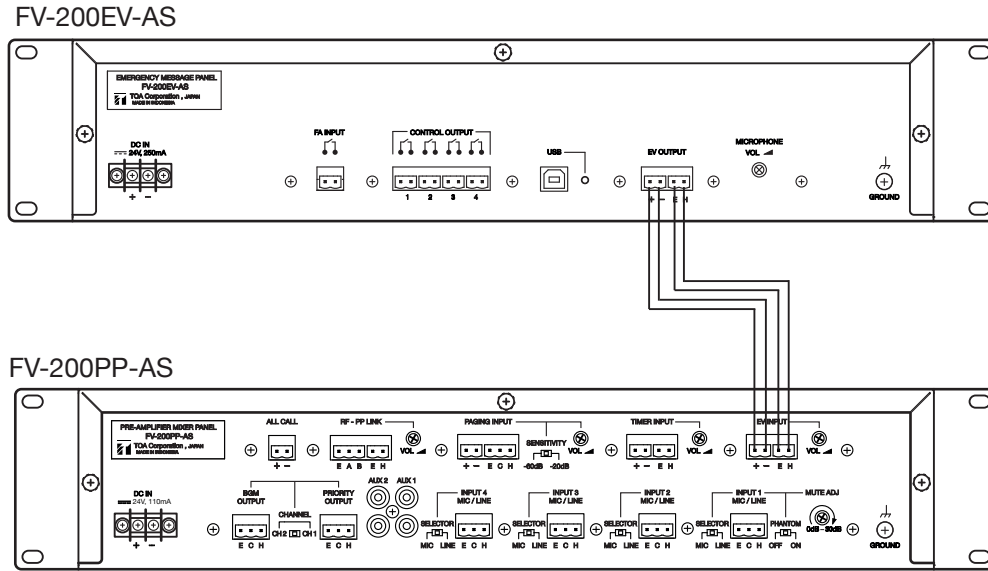
The following figure shows only the wiring related to the expansion of the 24 V DC power supply.



7.3 FV-200EV-AS Connection

Connecting the FV-200EV-AS enables automatic evacuation guidance broadcasts that are interlocked with signal from the connected automatic fire alarm system or manually operated voice guidance broadcasts. The FV-200EV-AS's built-in voice alarm provides pre-recorded fire alert, evacuation, false and clear announcements.

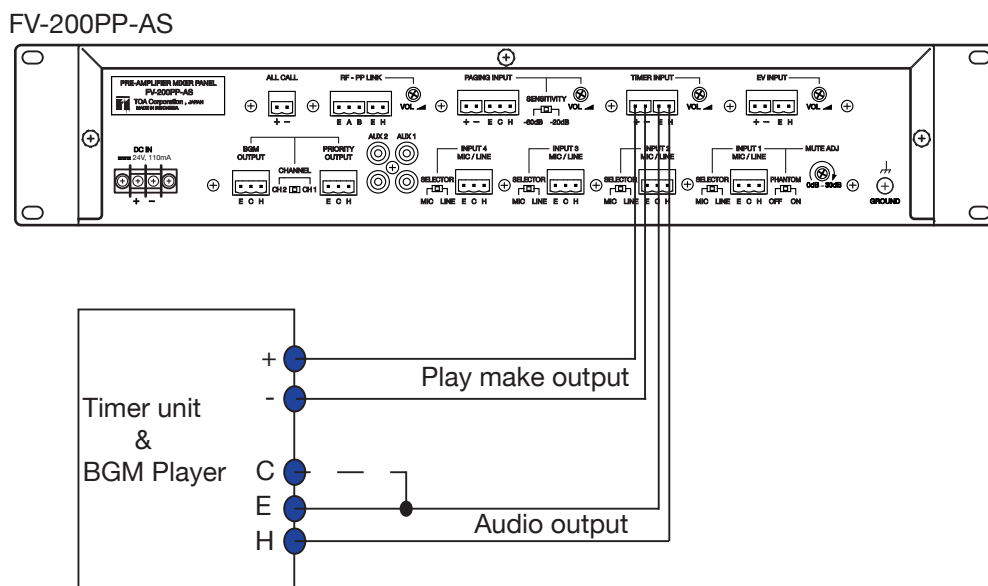
[Connection Diagram]



7.4 Timer-Operated Equipment

To make timer-operated broadcasts, connect the device equipped with the play make output to the FV-200PP-AS's Timer Input as follows. While the Timer Input's (+) and (-) terminals are closed, audio signals entering the Timer Input are output to all speaker lines.

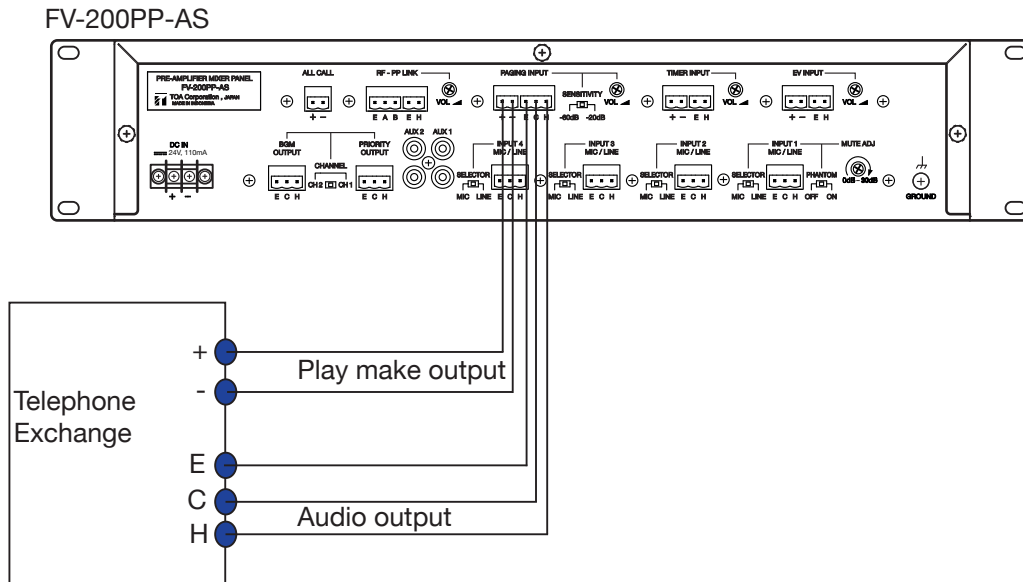
[Connection Diagram]



7.5 Telephone Paging

To enable telephone paging, connect control and audio signals from the telephone exchange's paging trunk to the FV-200PP-AS's Paging Input. While the Paging Input's (+) and (-) terminals are closed, audio signals entering the Paging Input are output to all speaker lines.

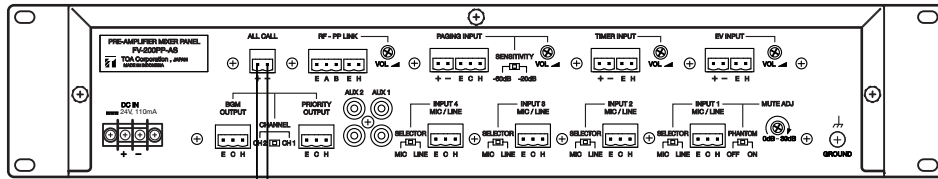
[Connection Diagram]



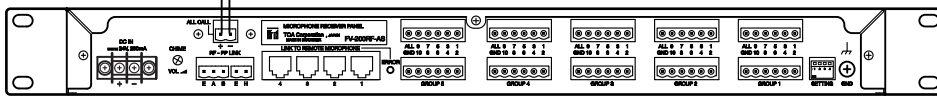
7.6 RF-PP Link Connection

Please connect ALL-CALL terminal and RF-PP LINK terminal between FV-200PP-AS and FV-200RF-AS.

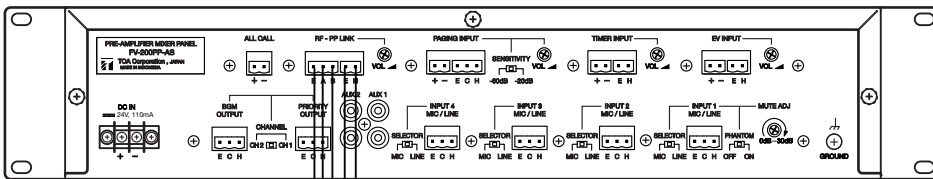
FV-200PP-AS



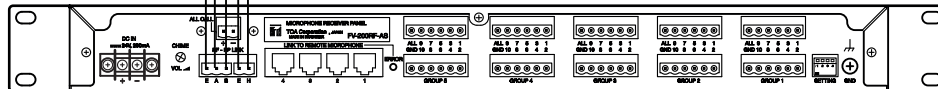
FV-200RF-AS



FV-200PP-AS



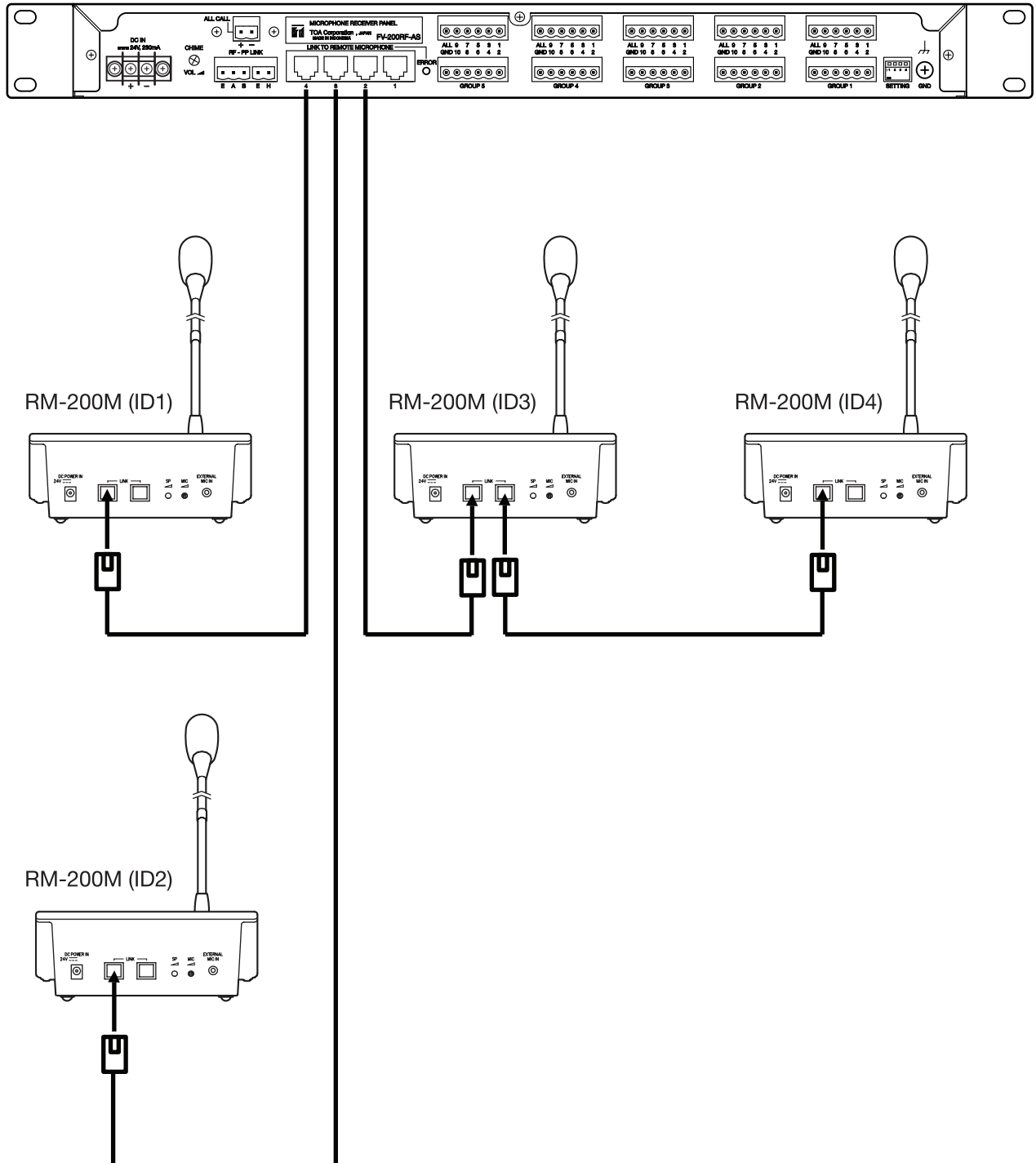
FV-200RF-AS



7.7 RM-200M Connection

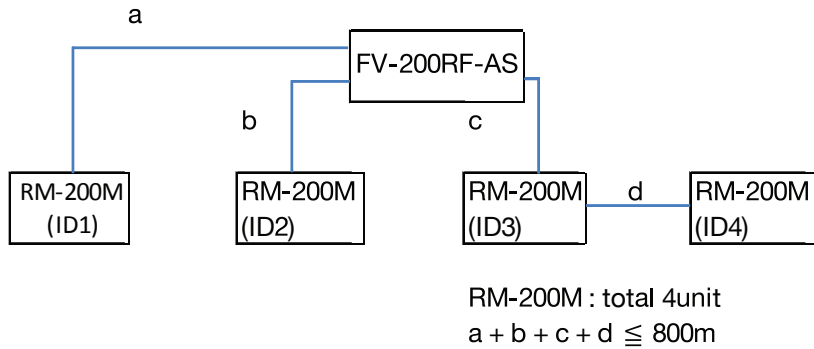
- The RM-200M is equipped with 2 link connectors, either of which can be used for connection.
- To connect an additional RM-200M, use either link connector.
- When connecting only RM-200Ms to the FV-200RF, a total of 4 RM-200Ms can be connected to the FV-200RF's RM LINK connectors.

FV-200RF-AS

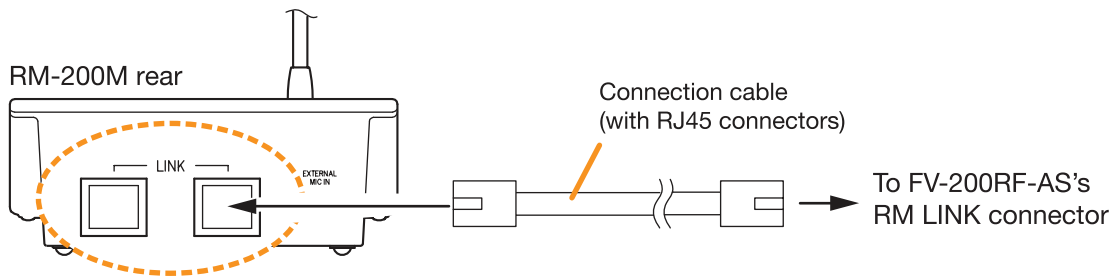


Notes

- The RM-200M is equipped with 2 link connectors, either of which can be used for connection.
- When STP Category 5 straight cable is used to connect between the FV-200RF-AS and remote microphones, the maximum cable distance in a system is 800 m in total.



7.7.1. RM-200M Connection without AC adapter



Without AC adapter plugged into RM-200M power will be supplied from system Power Supply through FV-200RF-AS DC Supply terminal.

- The following table shows the maximum cable distance when STP Category 5 straight cable (with RJ45 connectors) is used.

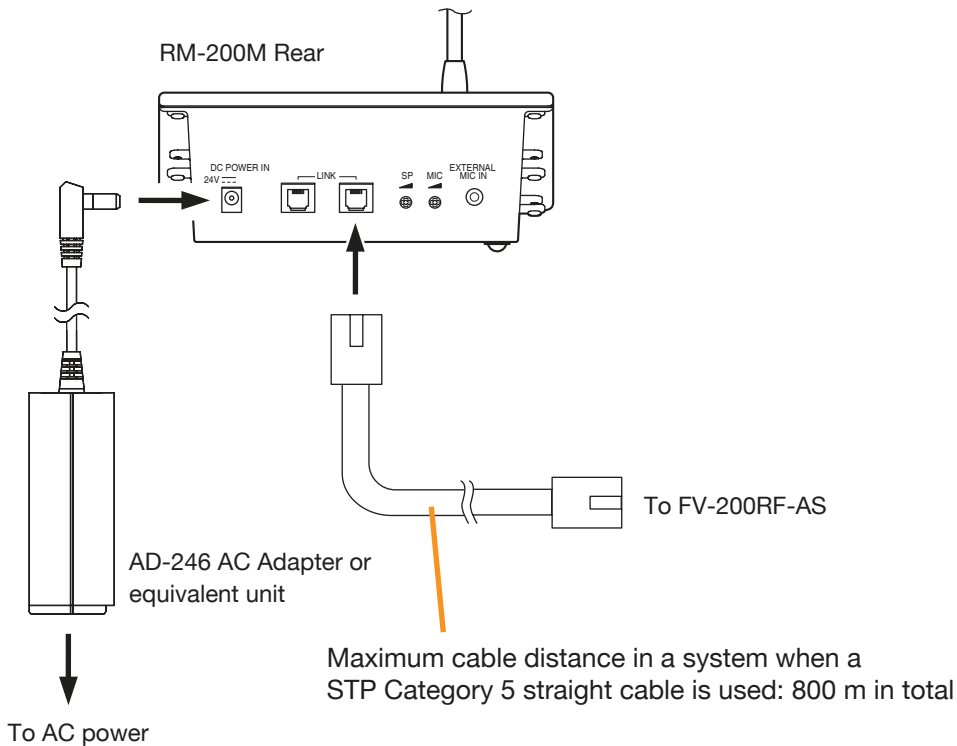
No. of expansion units		RM-200M alone
Cable		
	STP Category 5	140 m

- To make longer cable lengths than those shown in the above table, use over 4-pair shielded CPEV cable.

The relationship of the CPEV cable conductor diameter to the maximum cable distance is as follows:

No. of expansion units		RM-200M alone
Conductor diameter		
	ø0.65 mm	230 m
	ø0.9 mm	460 m
	ø1.2 mm	800 m

7.7.2. RM-200M Connection with AC adapter



- * Usable AC adapter
 - 24 V DC/over 200 mA (Operation range: 14 ~ 28 V DC)
 - Usable power input plug: Non-polarity type
 - (5.5 mm outer diameter, 2.1 mm inner diameter, and 9.5 mm long)

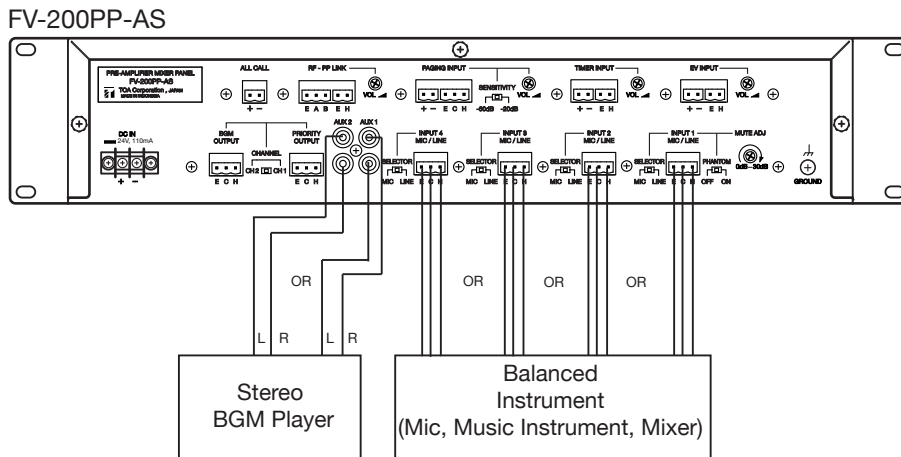
Note

Plugging a DC plug into the RM-200M's DC POWER IN terminal automatically switches the RM-200M's DC power input to this terminal, disconnecting the unit's power supply from the LINK connector. Be sure to firmly secure the DC plug by fixing the power cable onto the RM-200M's bottom-mounted cable hook. If the DC plug is pulled out, the LINK connector takes over the unit's power supply and is connected to the system power line. This may cause the voltage drop of power supply and increase the current consumption from the FV-200RF-AS, resulting in the system malfunction.

7.8 BGM Instrument

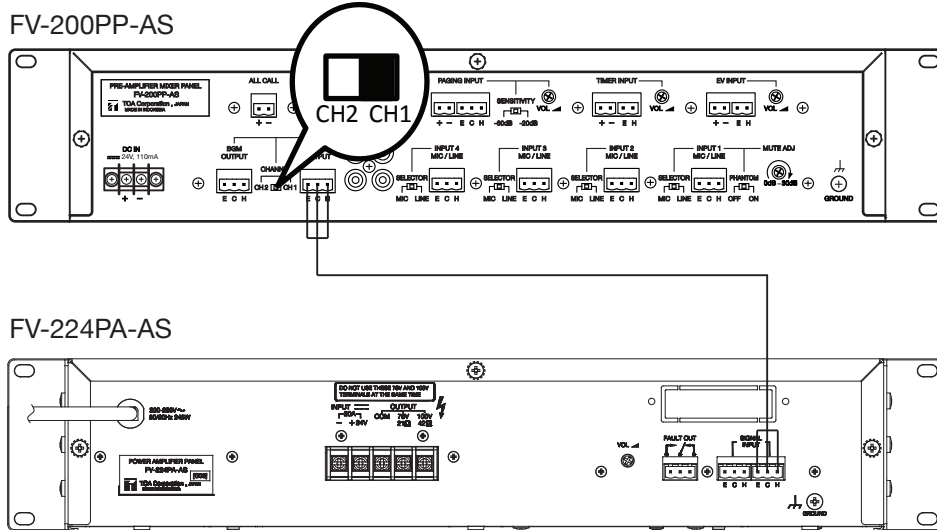
The FV-200PP-AS is equipped with 4 MIC/LINE Inputs and 2 AUX inputs for broadcasting background sound. The MIC/LINE Input 1 is provided with a muting function*. Connect the instrument like below picture.

*Muting function: A function that automatically decreases the volume of original broadcast when another broadcast is initiated during original broadcast, and restores the original broadcast volume level when the other broadcast is completed.

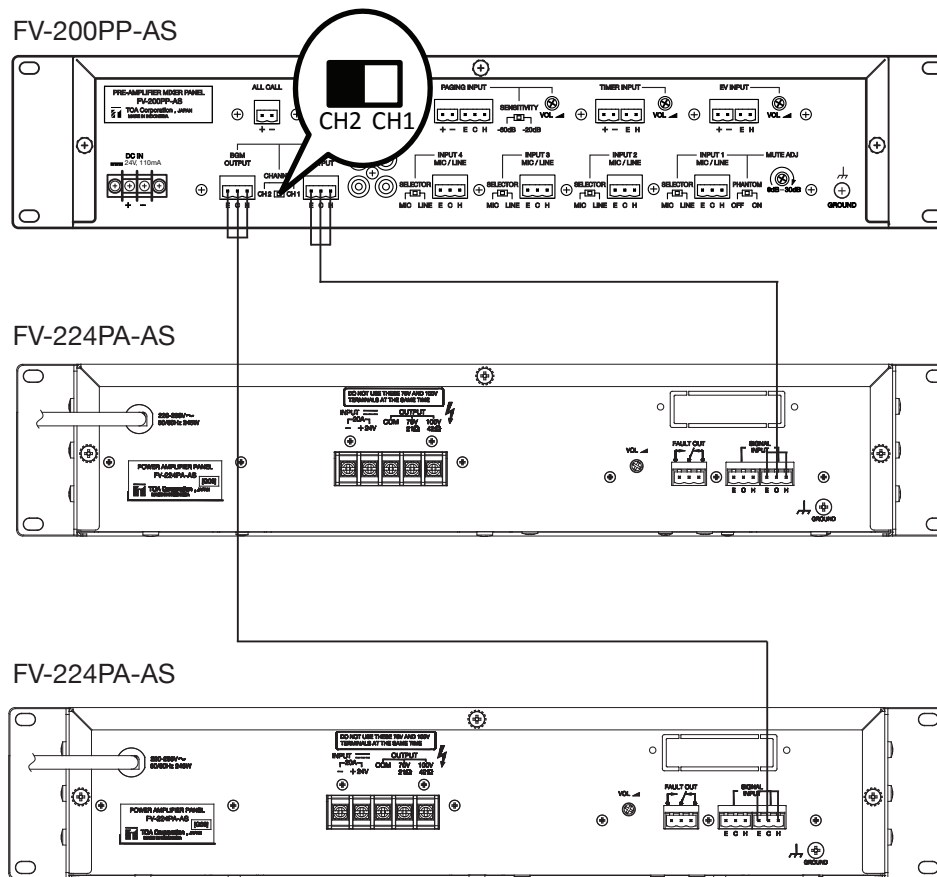


7.9 Power Amplifier Connection

7.9.1 1-Channel Broadcast

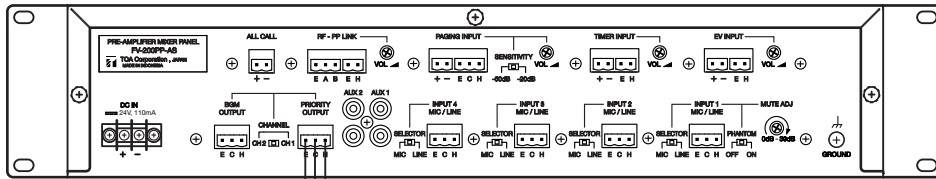


7.9.2 2-Channel Broadcast

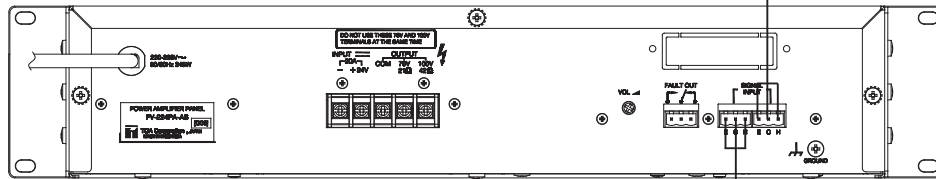


7.9.3 Power Amplifier Expansion

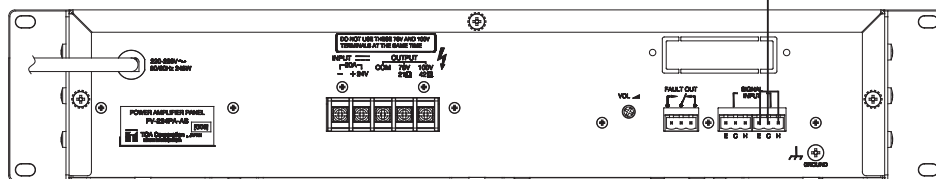
FV-200PP-AS



FV-224PA-AS

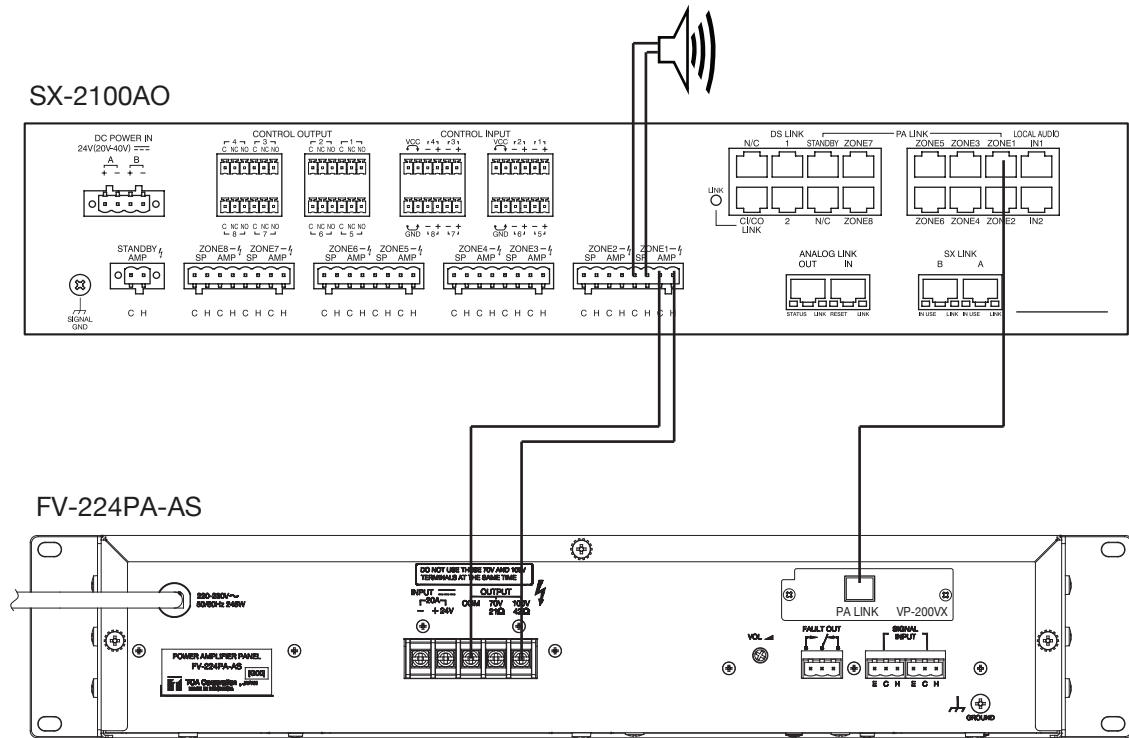


FV-224PA-AS



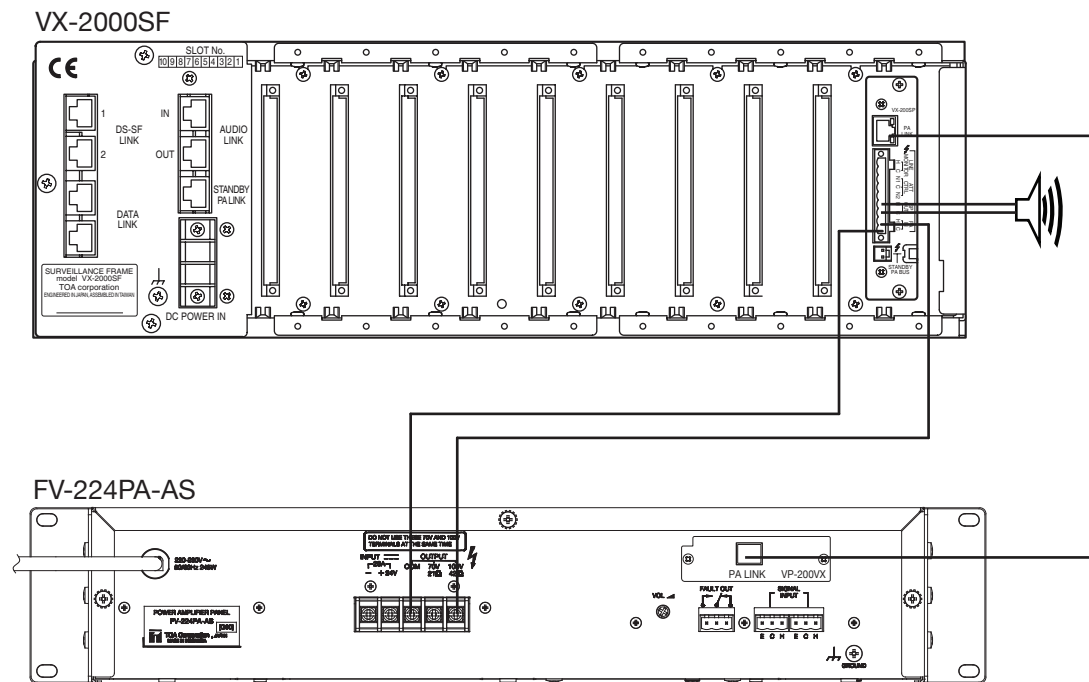
7.9.4 Power Amplifier Connection with SX-2000 system

FV-200 series amplifier unit can use with SX-2000 system. Please refer to SX-2000 series instruction manual and software setting manual.



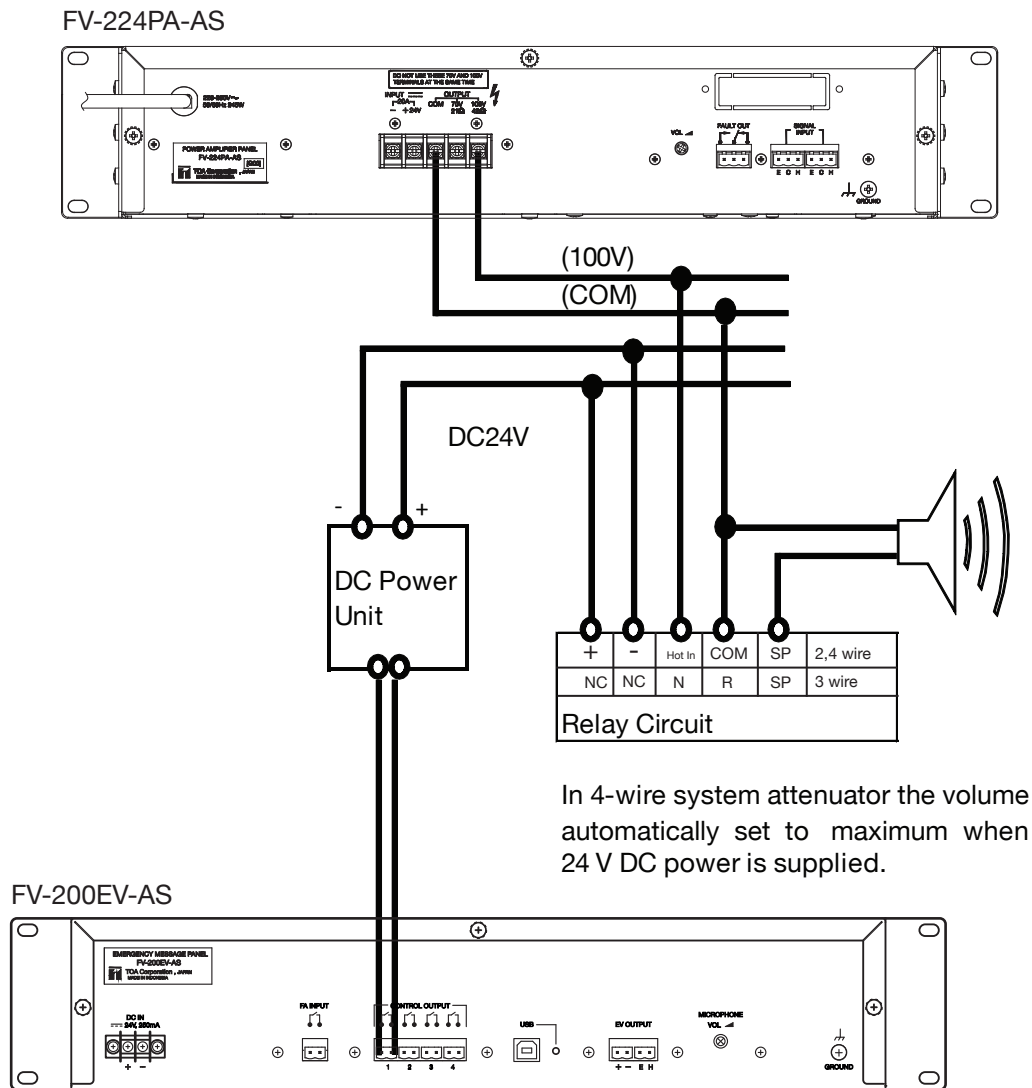
7.9.5 Power Amplifier Connection with VX-2000 system

FV-200 series Amplifier unit can use with VX-2000 system. Please refer to VX-2000 series instruction manual.

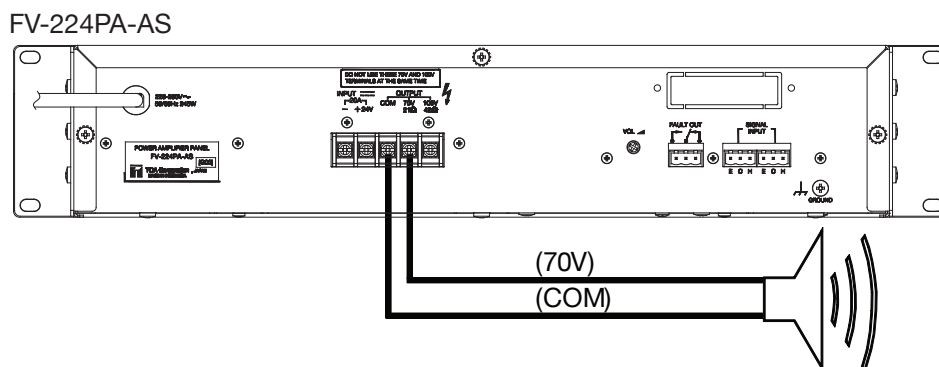


7.10 Connecting the Speaker and Attenuator

When an emergency broadcast is made, then 24 V DC power will be supplied to the attenuators from FV-200EV-AS to allow these broadcasts to be made at maximum volume by overriding the attenuators.



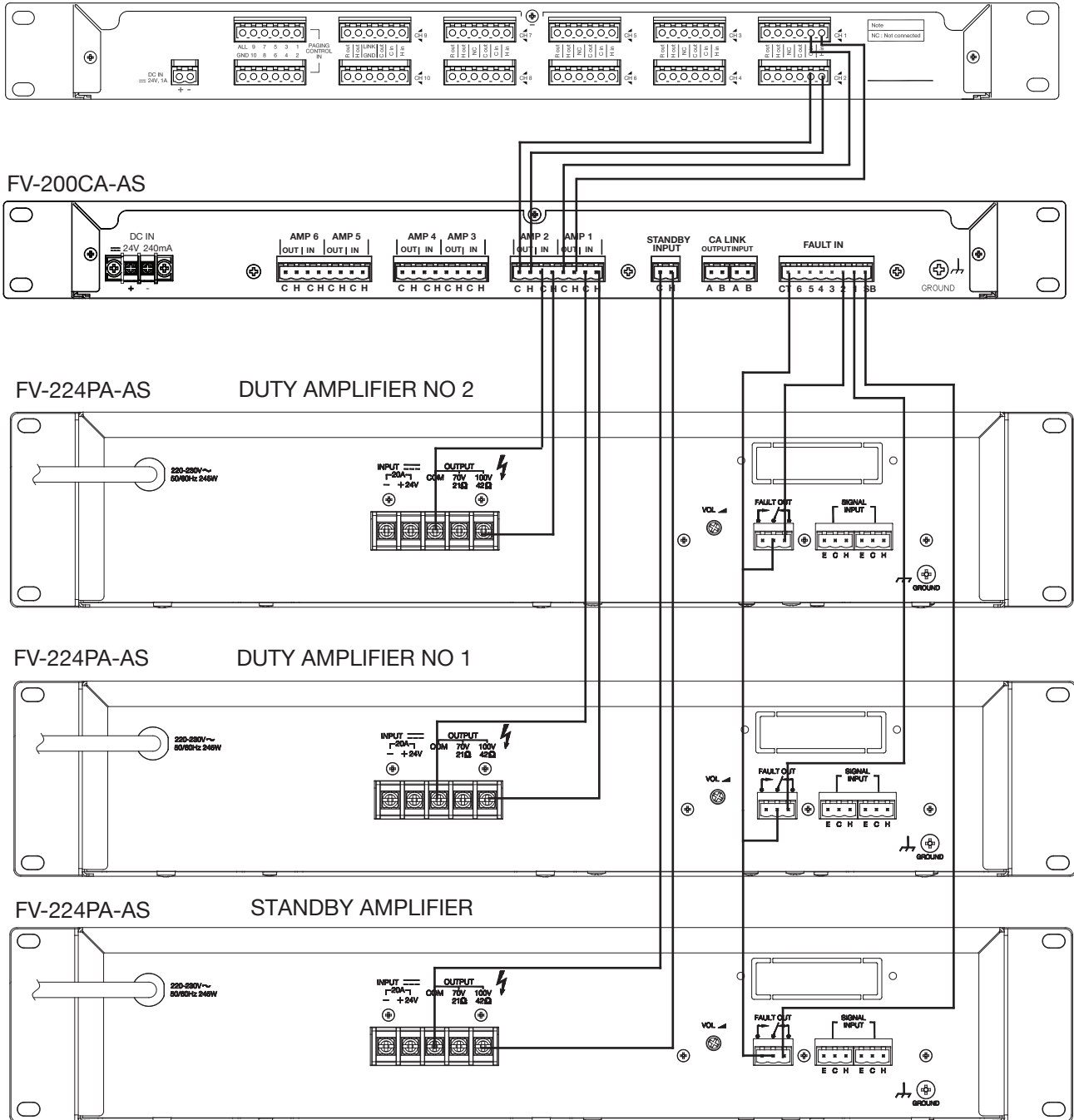
If use 70V line, the connection is follow. Do not use 70V and 100V line at the same time.



7.11 Changeover Amplifier Connection

Connect FAULT OUT from each power amplifier into FV-200CA-AS FAULT IN. Connect duty power amplifier output into FV-200CA-AS duty amp IN, connect standby power amplifier output into FV-200CA-AS STANDBY INPUT. Connect FV-200CA-AS duty amplifier output into speaker selector or directly into speaker.

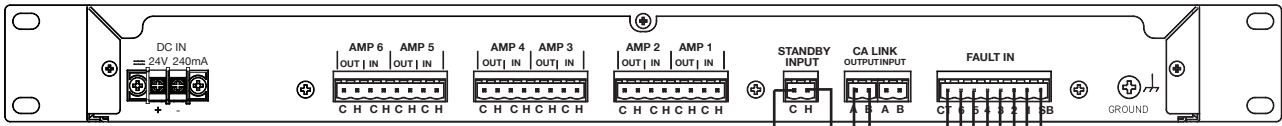
SS-1010R



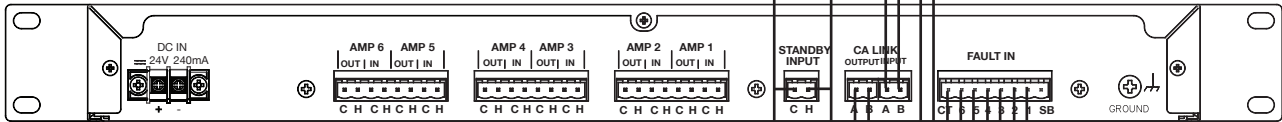
7.12 Changeover Amplifier Cascade Connection

FV-200CA-AS can make cascade connection up to 3 FV-200CA-AS, cascade connection make connection one standby amplifier can serve more than six duty amplifier.

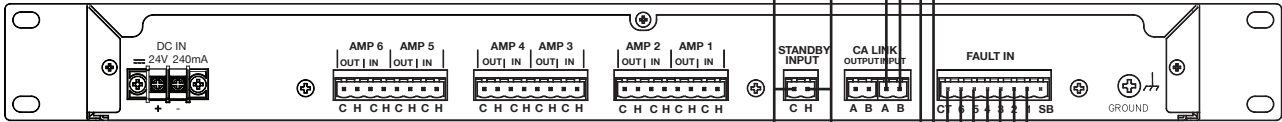
1st FV-200CA-AS



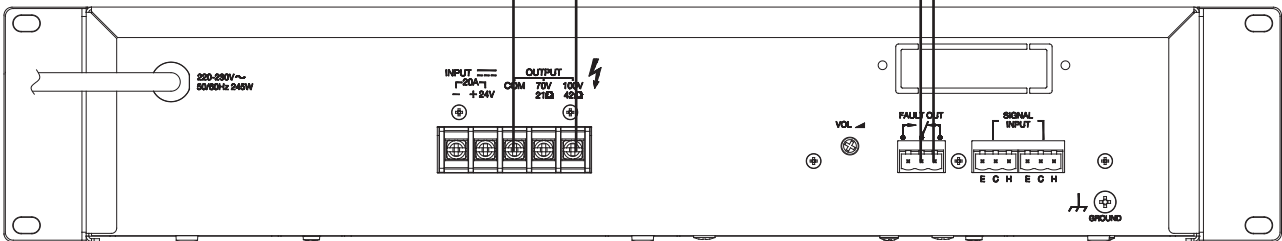
2nd FV-200CA-AS



3rd FV-200CA-AS

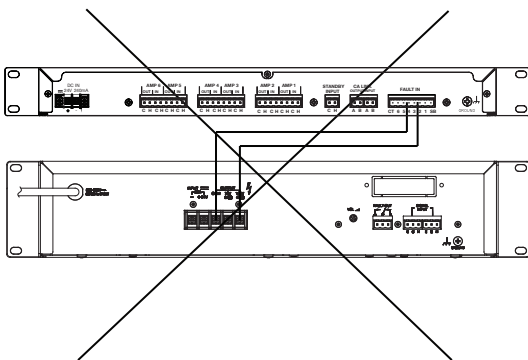


FV-224PA-AS STANDBY AMPLIFIER

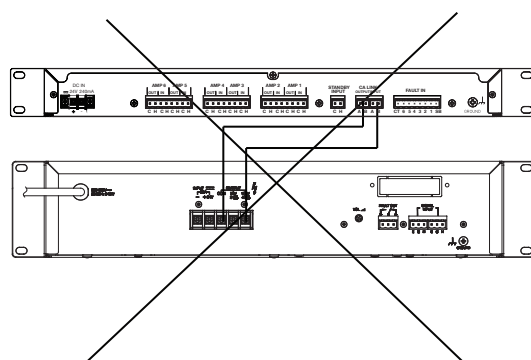


7.13 FV-200CA-AS Wrong Connection Warning

Do not connect DC output amplifier 100 V line to "CA LINK" or "FAULT IN" terminal, as doing so may cause product breakdown. This connection indicated as malfunction connection.



100 V AMPLIFIER OUTPUT
TO
FV-200CA-AS FAULT IN



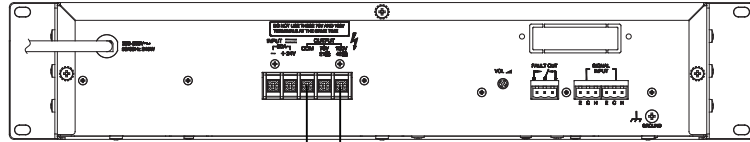
100 V AMPLIFIER OUTPUT
TO
FV-200CA-AS CA LINK

7.14 Speaker Selector Connection

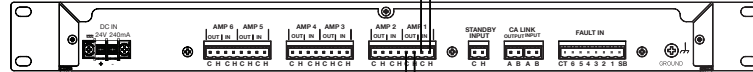
Speaker selector SS-2010, SS-1010, SS-1010R have maximum capacity 480W each zone, make sure not connect a speaker with total output more than 480W. Please use SS series from serial number 14E1100001 (May 2014) or later for best performance of system.

7.14.1 2 Channel Mode using SS-2010

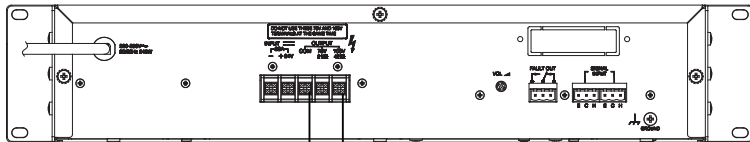
FV-224PA-AS (For B.G.M.)



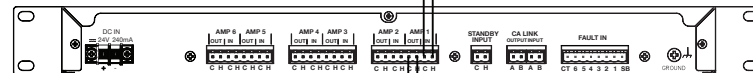
FV-200CA-AS



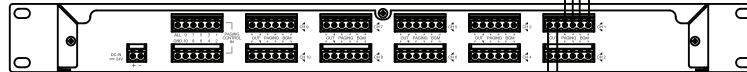
FV-224PA-AS (For Priority output)



FV-200CA-AS



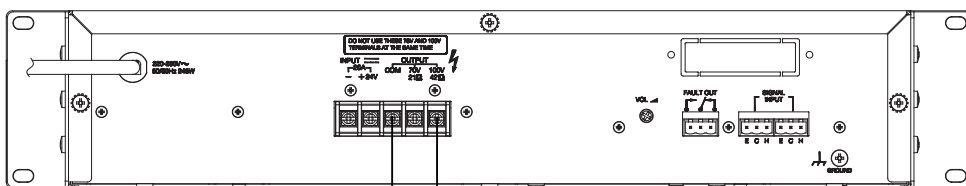
SS-2010



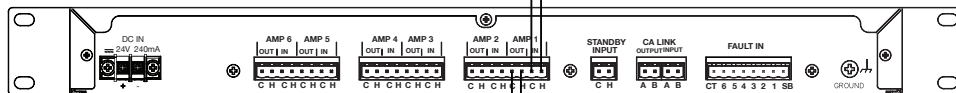
To attenuator (2 wire) and Speaker

7.14.2 1 Channel Mode using SS-1010

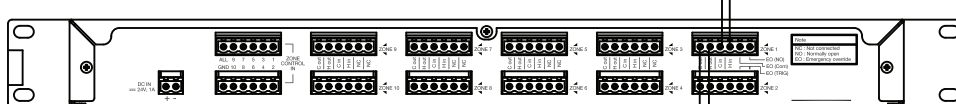
FV-224PA-AS



FV-200CA-AS

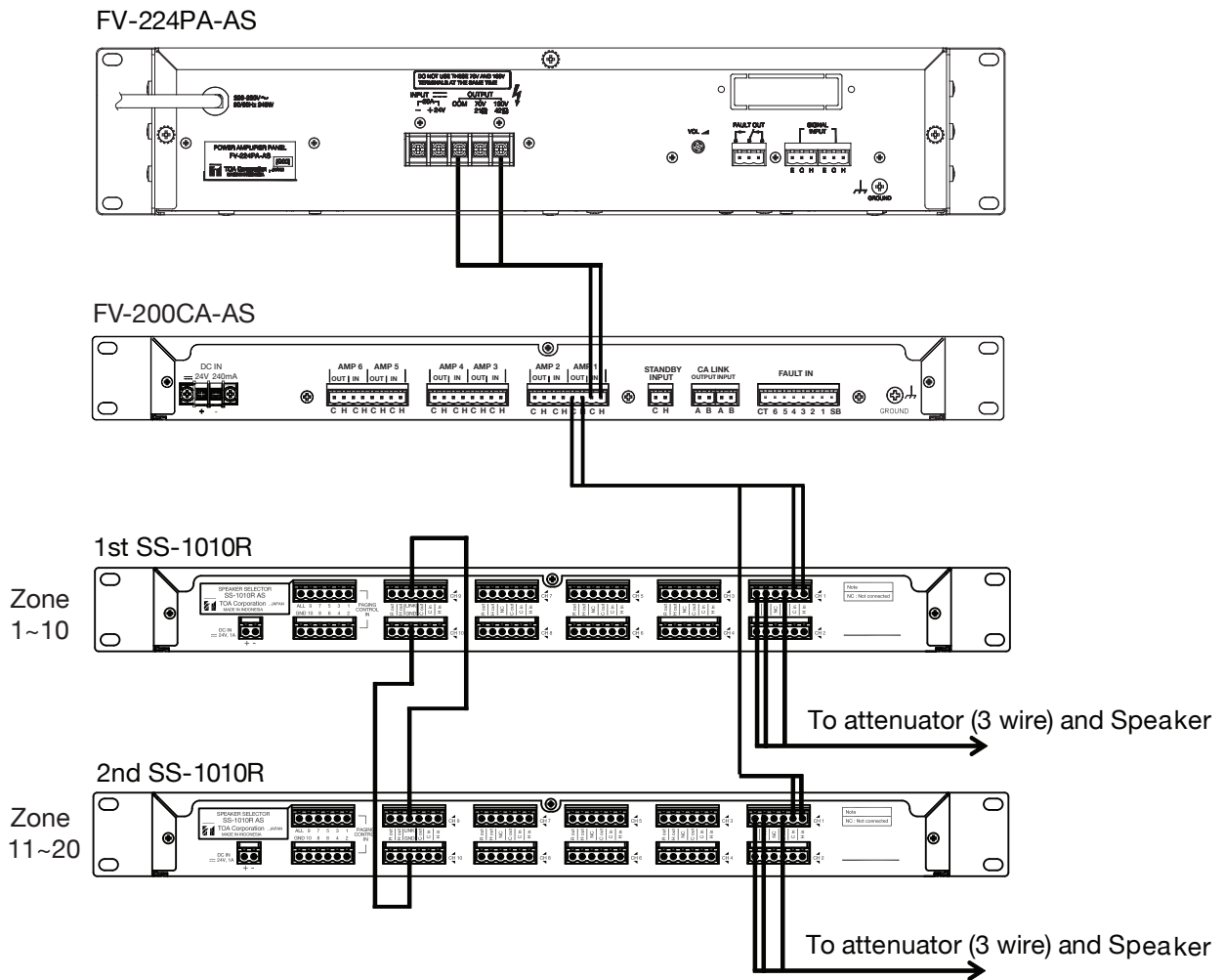


SS-1010



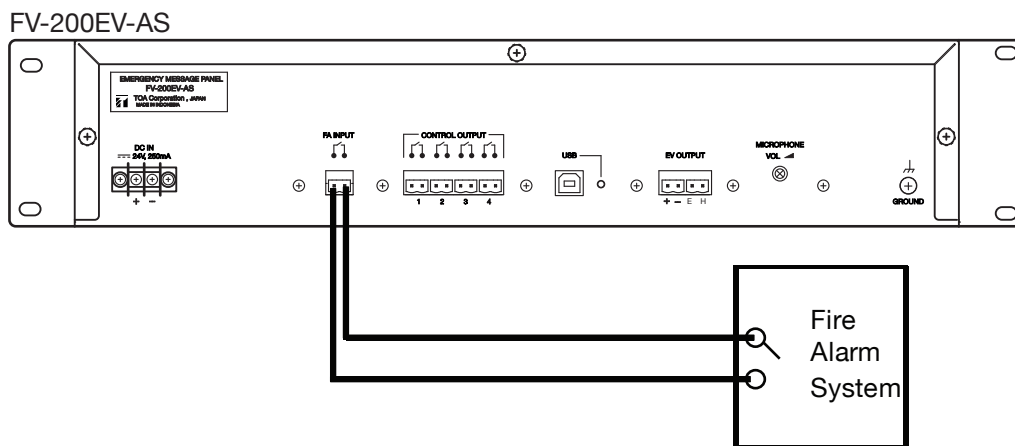
To attenuator (2 wire) and Speaker

7.14.3 1 Channel Mode using SS-1010R



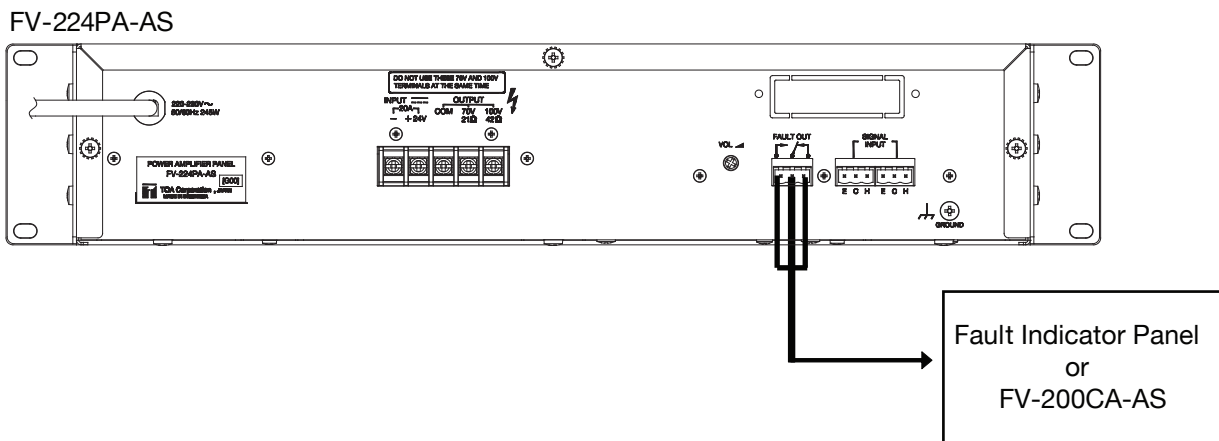
7.15 Automatic Fire Alarm Systems

Fire alert announcement can be made to all zones selected automatically when the connected automatic fire alarm system is activated.



7.16 Fault Out Connection

Power amplifier panel FV-224PA-AS/ FV-248PA-AS can control external equipments using fault out terminal. FV-224PA-AS/ FV-248PA-AS outputs contact when failure occurs in the unit.



7.17 Power Failure Backup

If broadcasts need to continue even during power failures, power must be supplied from an uninterruptible power supply system (UPS) or emergency power supply unit.

7.17.1 Providing Backup Power Using an Uninterruptible Power Supply (UPS) System

Using a UPS as a backup power source permits both emergency and general-purpose broadcasts to continue without interruption even if the main power source fails.

Procure a UPS that meets the following requirements and use it to supply AC power to equipment like the FV-200PS-AS, FV-224PA-AS and FV-248PA-AS that must operate continuously even during power failures. If the UPS does not meet the following requirements, it may shorten the amount of time that backup power can operate and/or may prevent continued broadcasts. Therefore, it is important that the UPS selected meets the necessary requirements.

[UPS Requirements]

- Switching time: Under 10 ms
- Capacity (W) is larger than the total capacity (W) of equipment being backed up.
- Capacity (VA) is larger than the total capacity (VA) of equipment being backed up.
- Backup time, calculated from the total capacity (W and VA), is over twice as long as the desired backup time.
- Output wave should be a sine wave.

7.17.2 Power Backup Using the VX-2000DS Emergency Power Supply Panel

Using the VX-2000DS as a backup power source permits both emergency and general-purpose broadcasts to continue without interruption even if the main power source fails. Please refer VX-2000DS manual for detail about using VX-2000DS as emergency power supply panel.

[Storage Battery Capacity Calculation]

The method for calculating the battery capacity of the emergency power supply unit needed to ensure sufficient power backup is described below.

The Storage battery capacity C required to operate for a fixed period of time (T₂) after waiting for a fixed period of time (T₁) can be calculated as follows. Select a battery with the capacity larger than the calculation result. Using Battery capacity conversation time table or Approximate expression (A), determine Capacity conversion time K corresponding to Discharge time T, then calculate the required battery capacity using the equation on below. Also see each unit specification in this manual to determine the current consumption during standby or operation.

$$\text{Storage battery capacity } C \text{ (Ah)} = \frac{1}{L} [K_1 I_1 + K_2 (I_2 - I_1)]$$

Where,

C : Required storage battery capacity at 25°C

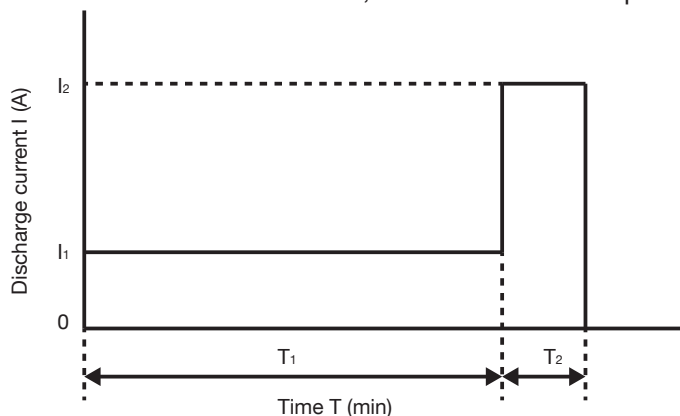
L : Maintenance rate* (generally 0.8)

K1 : Capacity conversion time corresponding to the sum (T1+T2) of Waiting time T1 and Operation time T2 .

K2 : Capacity conversion time corresponding to Operation time T2 .

I1 : Current consumption in standby or idle from the time that power fails until emergency broadcasting begins. This is the sum of all currents needed by all the units in system consuming power even during power failures.

I2 : Power consumption during emergency broadcast (the 24V DC current consumption of the entire system) when 4-wire system attenuators are connected, their current consumptions are also included.

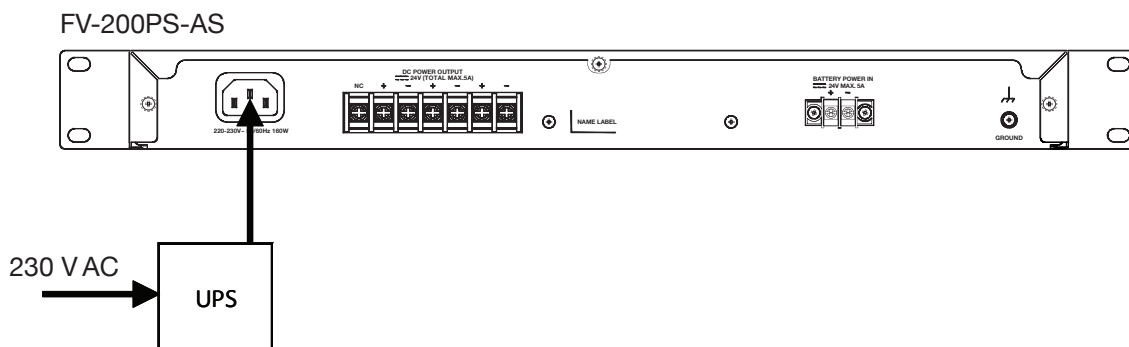


Discharge Time (minutes)	Capacity Conversion Time K (hours)	*Maintenance rate is a correction value used to guarantee needed battery capacity and satisfy specified load characteristics while accounting for variations caused by battery age and usage conditions. As a general guideline, it is assumed that battery capacity decreased to 80% of the original represents the end of the battery's useful life, and therefore a maintenance rate of 0.8 is used in these calculations.
10	0.333	
20	0.575	
30	0.820	
40	1.06	
50	1.30	
60	1.55	
70	1.80	
80	2.05	
90	2.28	
100	2.50	

When capacity conversion coefficients corresponding to the operation time (discharge time) of more than 100 minutes is needed, approximate values can be obtained from the following expression:

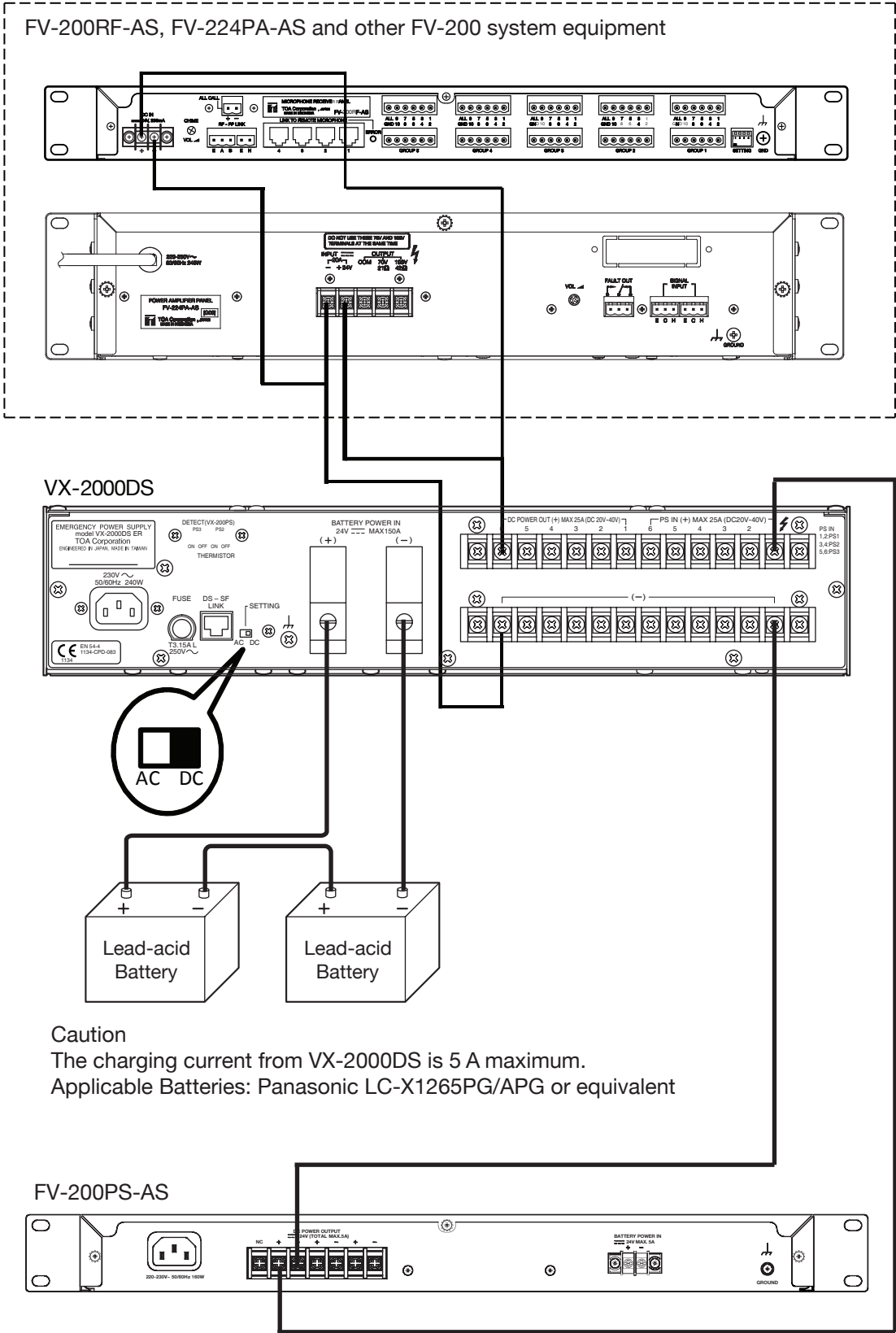
$$\text{Capacity conversion time K} = 0.0217 \times \text{Discharge time} + 0.33 \dots\dots\dots (A)$$

7.17.3 Wiring Diagram Connection to UPS



7.17.4 Power Failure Backup with VX-2000DS Wiring Connection

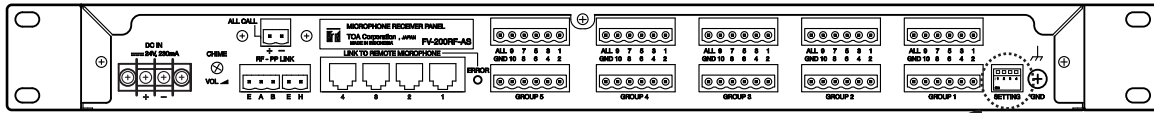
Recommended connection to VX-2000DS (Online Connection)



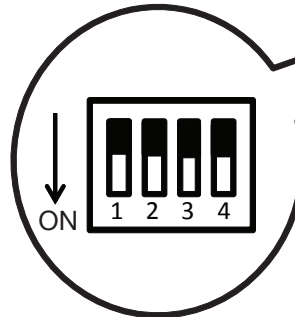
8.1. SETTINGS

8.1. FV-200RF-AS Settings

8.1.1. DIP Switch Functions



Switch No.	Function	Factory preset
1	Priority Setting	OFF
2		OFF
3	Unit Number Setting	OFF
4		OFF



Please set DIP Switch before power supply to unit.

8.1.2. Priority Setting : Last-in-first-out / First-in-first-out / Individual priority

(Default: Last-in-first-out)

Designate priorities among announcements made simultaneously from multiple connected RM-200M microphones. There are 4 priority setting methods, as follows:

- Last-in-first-out (LIFO)

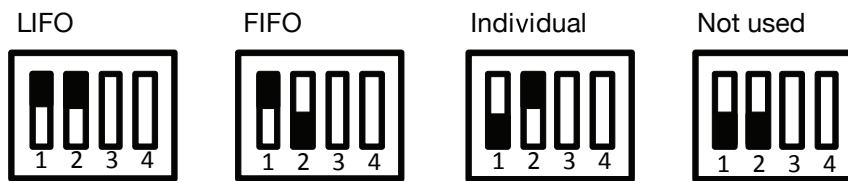
The announcement from the RM-200M last operated takes precedence.

- First-in-first-out (FIFO)

The announcement from the RM-200M first operated takes precedence. Until this announcement is completed, other RM-200M microphones cannot make broadcasts.

- Individual Priority*

The announcement from the RM-200M assigned a smaller address number takes precedence. The RM-200M with an address number smaller than that of the RM-200M currently making broadcasts can make broadcasts to the selected zones. However, the RM-200M with a larger address number must wait until the current announcement is completed.



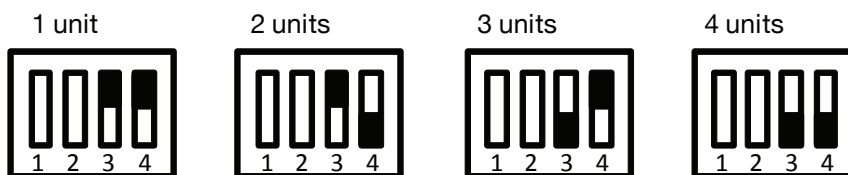
* If Individual Priority is selected, the smaller the address number, the higher priorities among the connected RM-200RMs. ID 1 > ID 2 > ID 3 > ID 4

After priority setting change system must be reset to apply new priority setting.

8.1.3. RM-200M Unit Number Setting

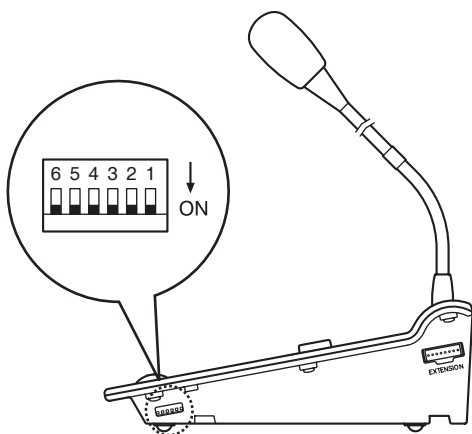
(Default: 1)

Set the number of RM-200M units to be connected to the FV-200RF-AS.



8.2 REMOTE MICROPHONE SETTINGS

8.2.1. DIP Switch Functions



RM-200M side

Switch No.	Function	Factory-preset
1	Unit ID No. setting	ON
2		
3	—	
4	Talk key operation	
5	—	
6	Compression ON/OFF	

8.2.2. Unit ID Number Settings (Switch 1 and 2 operation)

To set the unit ID number, use the DIP switches 1 and 2 for the RM-200M.

Note

The DIP switch is located on the side surface for the RM-200M.

Unit ID No.	Switch No. 1	Switch No. 2
1	ON	ON
2	OFF	ON
3	ON	OFF
4	OFF	OFF

8.2.3. Talk Key Settings (Switch 4 operation)

Set the operating system of the RM-200M's front-mounted Talk key.

Setting the DIP switch 4 located on the RM-200M's side surface to ON enables announcement to be broadcast while the Talk key is held down. Releasing the Talk key terminates the broadcast. (Press-To-Talk or PTT mode)

Setting the DIP switch 4 to OFF enables a broadcast to initiate and pressing the key again terminates the broadcast. (Lock mode)
(Default: ON)

8.2.4. Compression Settings (Switch 6 operation)

To perform compression settings, use the DIP switch No. 6 for RM-200M.

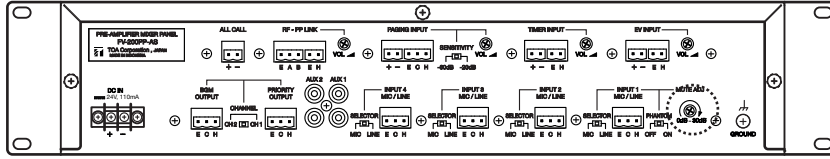
Note :

The DIP switch is located on the side surface for the RM-200M. Setting the DIP switch to ON enable announcements to be broadcast without distortion even if excessive input signal is applied to the microphone. (Default: ON)

8.3 Muting Function

MIC/LINE input 1 has a priority function. When MIC/LINE input 1 is used, it takes precedence and automatically reduces the volume of MIC/LINE input 2 ~ 4, Aux1 and Aux2 inputs by 0 to 30 dB, which is adjustable with the MUTE ADJ on rear panel. The attenuation level is preset for 0 dB at the factory.

FV-200PP-AS



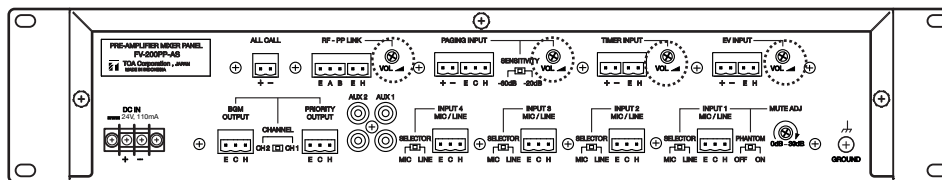
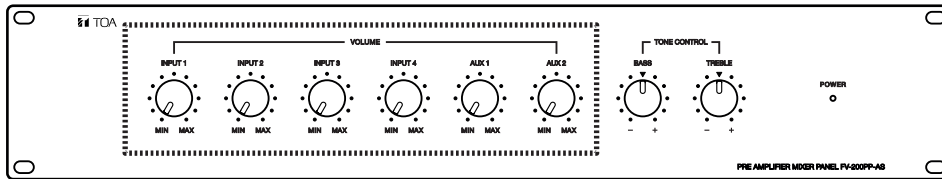
MUTE ADJ



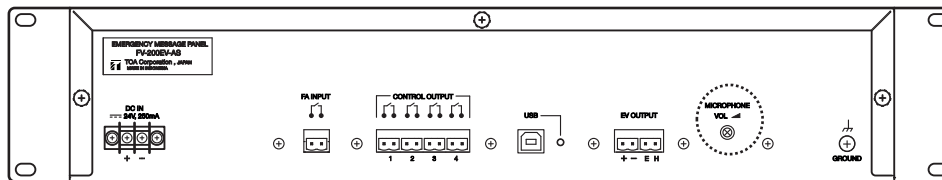
8.4 Volume Control Settings

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

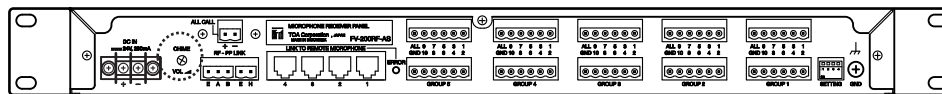
FV-200PP-AS



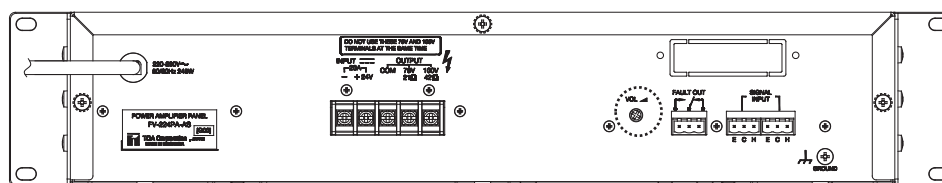
FV-200EV-AS



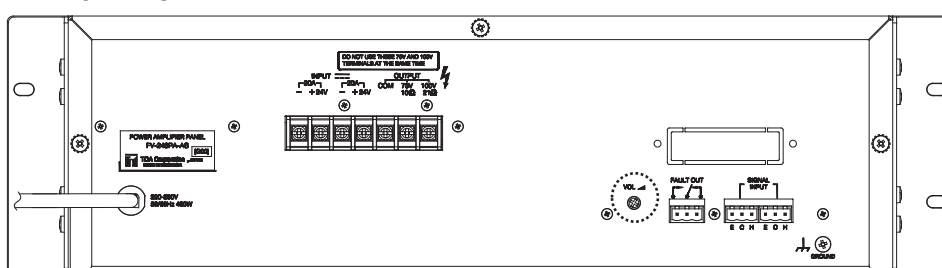
FV-200RF-AS



FV-224PA-AS



FV-248PA-AS



9. OPERATION

9.1. Emergency Broadcasts

A system that integrates the FV-200EV-AS allows emergency broadcasts to be made automatically, through connection to an automatic fire alarm system, or manually via ALERT button or Fireman's microphone in FV-200EV-AS unit.

Emergency broadcasts have the highest priority. When an emergency broadcast is activated, General-purpose broadcasts* are stopped to allow the emergency broadcast to be heard. Emergency broadcast is performed to all zone.

When an emergency broadcast ends,

- If the broadcast was from the RM-200M, then it will return to stand by state (not broadcasting).
- If the broadcast was a paging or timer-activated automatic broadcast.

The broadcast will resume if the paging operation or timer input activation still continues.

*Refer to "Types of General-Purpose Broadcasts" explained in the following section.

[Pre-recorded voice alarm messages set at the factory are as follows]

Alert announcement: (Female Voice)

(Siren tone * 3 times)

Attention please!

The fire alarm has been activated.

We are now investigating the cause.

Please wait for further information.

Evacuation announcement: (Male Voice)

(Siren tone * 3 times)

There is a fire!

Please evacuate in a calm and orderly manner.

(Alert tone * 3 times)

False alarm announcement: (Female Voice)

(Siren tone * 3 times)

Attention please!

We have investigated the situation and there has been a false alarm.

We apologize for any inconvenience caused.

Clear announcement: (Female Voice)

(Siren tone * 3 times)

Attention please!

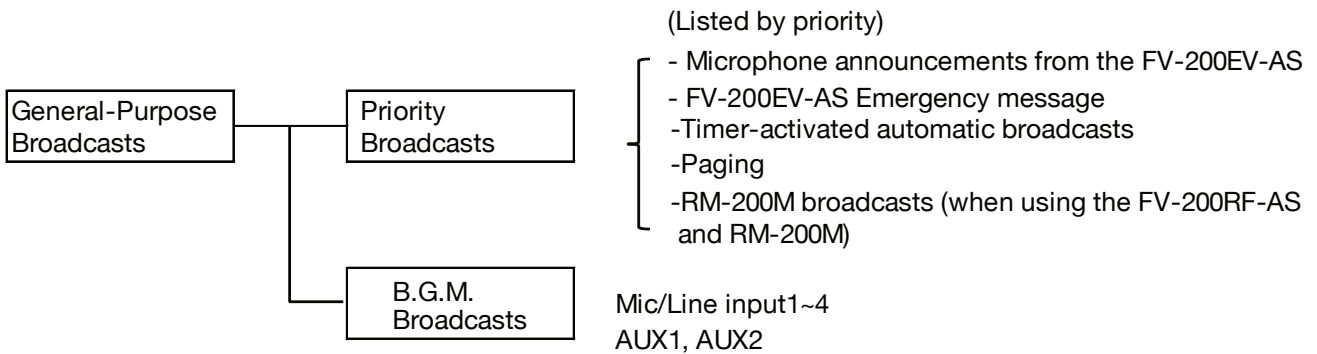
The emergency situation is now under control.

We regret any inconvenience caused.

9.2. General-Purpose Broadcasts

9.2.1. Types of General-Purpose Broadcasts

General-purpose broadcasts can be classified as follows, depending on the type of equipment, broadcast priority, etc.



[Microphone announcements from the FV-200EV-AS]

Microphone announcements can be made to all areas using the FV-200EV-AS fireman's microphone only press the talk key.

[FV-200EV-AS Emergency message]

When the EV Input on the rear of the FV-200PP-AS receives an audio signal and a control signal from the FV-200EV-AS, the broadcast is made to all zones during EV Output terminal is active.

[Timer-activated automatic broadcasts]

When the Timer Input on the rear of the FV-200PP-AS receives an audio signal and a control signal from a music play component, the broadcast is made to all zones during operation of the music play component.

[Paging]

When the Paging Input on the rear of the FV-200PP-AS receives an audio signal and a control signal from a telephone exchange, a paging call from a telephone set is made to all zones.

[Announcements from the RM-200M (with the FV-200RF-AS and RM-200M installed)]

Microphone announcements can be made to specific areas selected using the Zone Selector Keys on the RM-200M or RM-210.

[BGM Broadcasts]

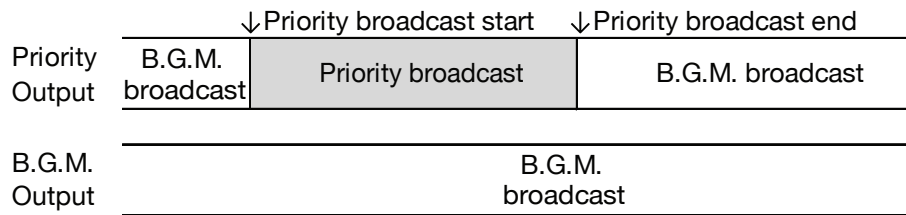
For systems equipped with a 2-channel power amplifier and capable of 2-channel broadcasting, the BGM Zone Selector Keys on the SS-2010 may be used to select broadcast areas, allowing broadcasts from the music play component connected to the FV-200PP-AS's BGM input. For systems equipped with a 1-channel power amplifier and capable of 1-channel broadcasting, the BGM broadcast areas can be selected at the SS-1010 or SS-1010R.

9.2.2. BGM Broadcasts & Priority Broadcasts

2-Channel Broadcasting

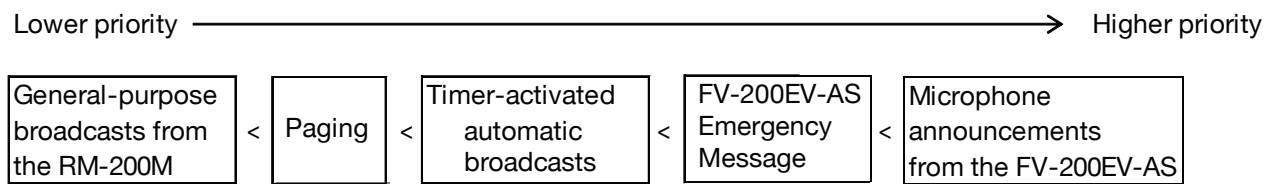
		↓ Priority broadcast start	↓ Priority broadcast end
Priority Output	No output	Priority broadcast	No output
B.G.M. Output	B.G.M. broadcast		

1-Channel Broadcasting



9.2.3. Order of Priority among Priority Broadcasts

Priority broadcasts are not broadcast all at once; rather, they are issued one at a time following a specific order of priority, as follows.



Example: If the microphone announcements from the FV-200EV-AS is in progress, only that broadcast will be performed, and other broadcasts will not be made.

[Order of priority among the RM-200M units]

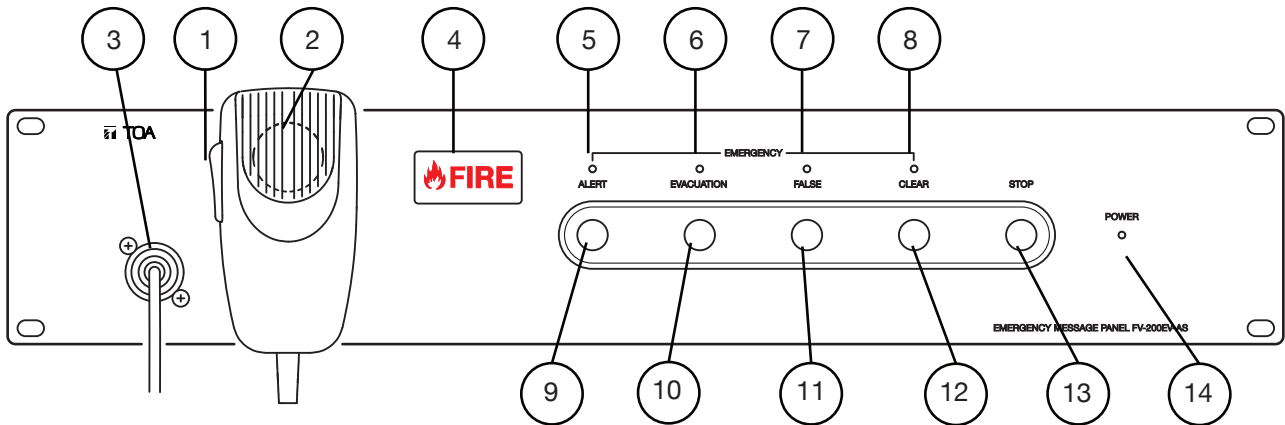
When multiple RM-200M units are connected, the following modes are available for determining broadcast priority among them. Select the desired mode using the Setting Switch on the rear of the FV-200RF-AS.

- Last-in-first-out (LIFO): Priority is given to the RM-200M unit that last selected a broadcast area.
- First-in-first-out (FIFO): Priority is given to the RM-200M unit that first selected a broadcast area, and broadcasts from other RM-200M units are not possible until that broadcast has been finished.
- Individual: Priority is given to the RM-200M unit with the lowest address number.

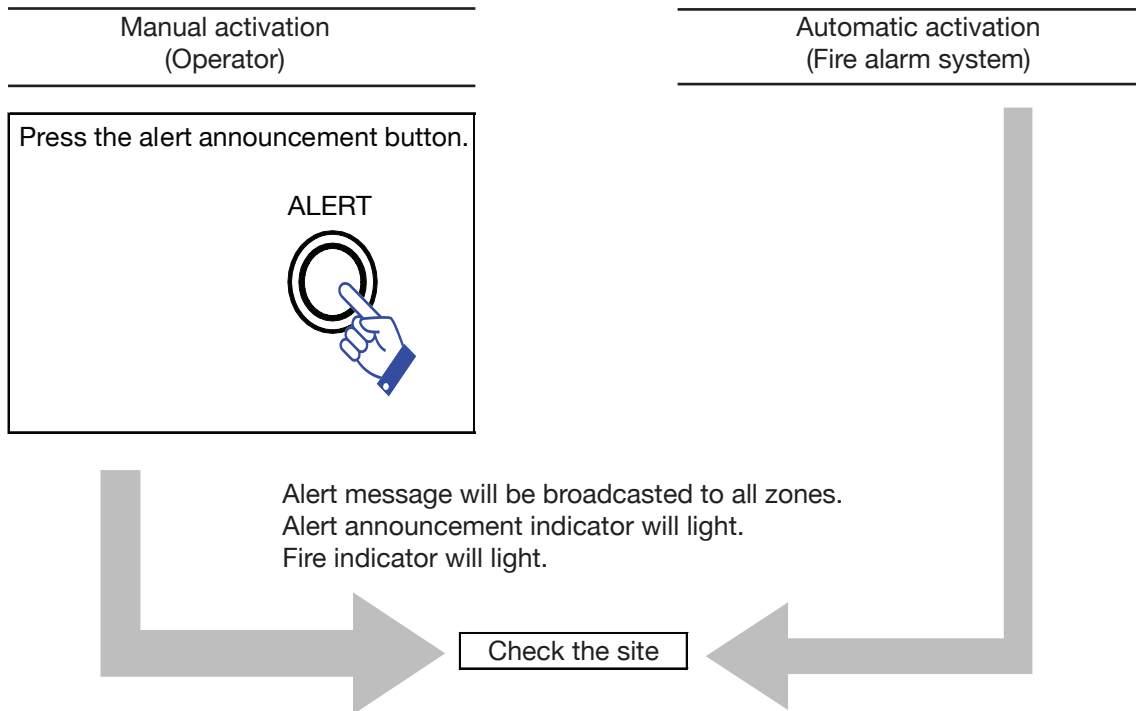
9.3 Emergency operating procedures

Under manual operation, the broadcast to all areas and the broadcast is conducted using either a microphone or the pre-recorded voice alarm messages stored in the FV-200EV-AS.

[Buttons and keys used for operation]



- | | |
|--------------------------------------|------------------------------------|
| 1. Talk Switch | 8. Clear Announcement Indicator |
| 2. Fireman's Microphone | 9. Alert Announcement Button |
| 3. Fireman's Microphone Connector | 10. Evacuation Announcement Button |
| 4. Fire Indicator | 11. False Announcement Button |
| 5. Alert Announcement Indicator | 12. Clear Announcement Button |
| 6. Evacuation Announcement Indicator | 13. Stop Button |
| 7. False Announcement Indicator | 14. Power Indicator |



Check the site



In case of fire

Press the evacuation announcement button.

EVACUATION



Evacuation message will be broadcasted to all zones. Evacuation announcement indicator will light.



Make microphone broadcast

Press the fireman's talk switch to broadcast to all zone.



When the fire was extinguished

Press the clear announcement button.

CLEAR



Clear message will be broadcasted to all zones. Clear announcement indicator will light.



In case of no fire

Press the false announcement button.

FALSE



False message will be broadcasted to all zones. False announcement indicator will light.



Finish emergency broadcast

Reset the fire alarm system and press the stop button.

STOP



Fire indicator will unlit.
General-purpose broadcast will start.

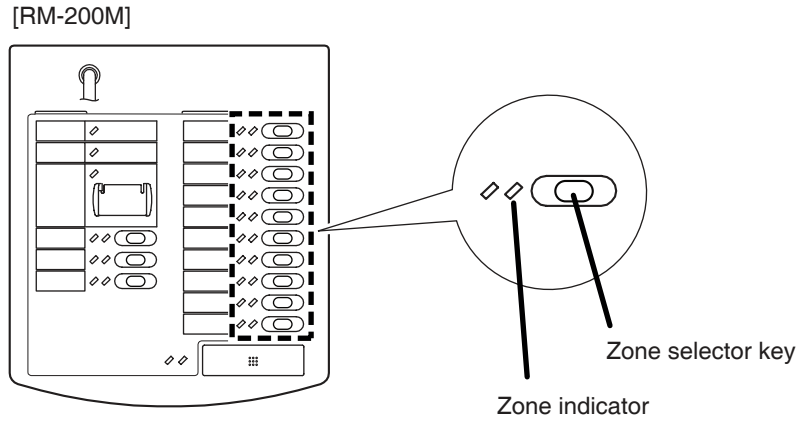
Note:

If fire alarm input terminal is closed, Stop switch not work. Before press the stop switch, open the fire alarm input terminal.

9.4 Broadcasting from the RM-200M

[Individual zone broadcast operation]

Step 1. Press the broadcast zone selector key to select the broadcast zone. The selected zone's indicator lights green

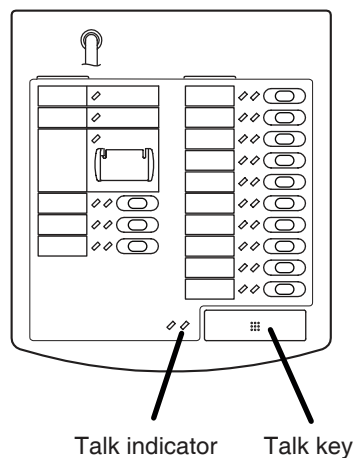


Step 2. Press the Talk key to make an broadcast. The talk indicator lights green while the Talk key is pressed.

Notes : Two modes are available for Talk key operation: "PTT" and "Lock" modes.

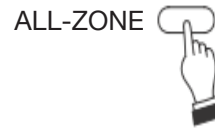
- When the talk key is set to PTT mode, announcements can only be broadcast while the Talk key is held down. Releasing the Talk key terminates the broadcast and extinguishes the indicator.
- When set to Lock mode, pressing the Talk key initiates a broadcast and pressing the key again terminates the broadcast and extinguishes the indicator.

To set the Talk key mode, use the DIP switch located on the side of the RM-200M.
(Refer to 8.2.3. Talk Key Settings)



[All-Zone broadcast operation]

Step 1. Press the ALL-ZONE key.
The All-zone indicator and all zone indicators will light.
(Press the ALL-ZONE key again to cancel.)



Step 2. Check the Busy indicator.
(1) When the indicator remains off, other connected equipment are not in use for broadcast.
(2) When the indicator flashes, other priority broadcasts are performed.

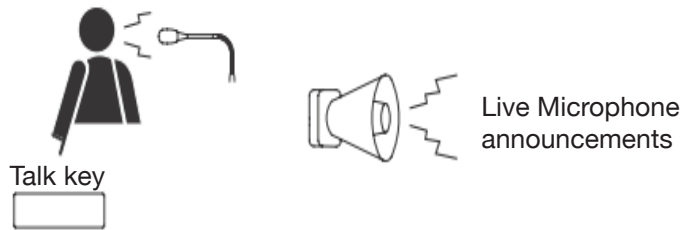


[Press-to-talk operation]

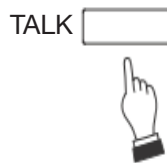
Step 3. Start of broadcast
3-1. Hold down the TALK key.
A start chime tone will be sounded over the broadcast zone.
The In-use indicator will flashes green.



3-2. After chime play completion, make an announcement using the microphone.



Step 4. End of broadcast
Releasing the Talk key.
The In-use indicator goes out.

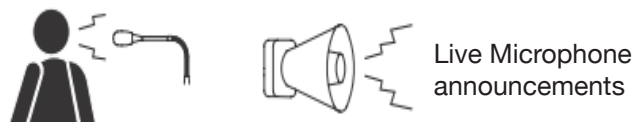


[Lock operation]

Step 3. Start of broadcast
3-1. One-touch press the TALK key.
A start chime tone will be sounded over the broadcast zone.
The In-use indicator will light green.



3-2. After the chime play is finished, make an announcement at the microphone.



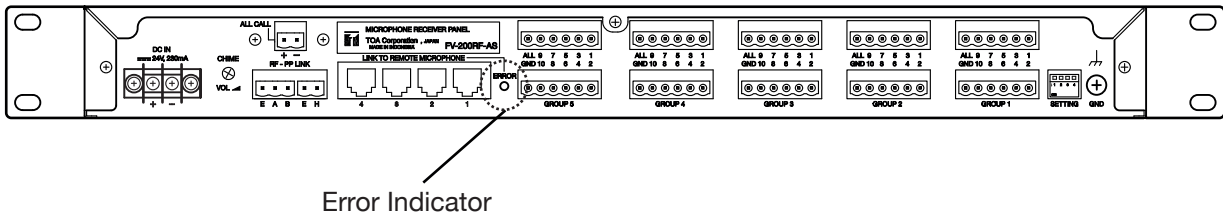
Step 4. End of broadcast
One-touch pressing the TALK key again. The In-use indicator goes out.



10. FAILURE INDICATION

[FV-200RF-AS]

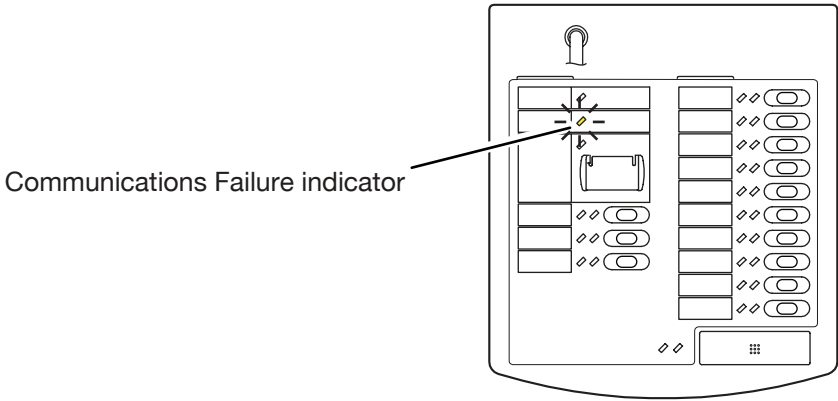
The Error indicator light is red



A communication failure has occurred between the RM-200M and the FV-200RF-AS. The previous status is automatically restored if communications return to normal.

[RM-200M]

If fault indicator flashes orange, then a communication failure has occurred between the RM-200M and the FV-200RF-AS.

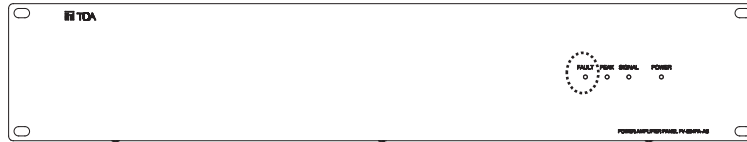


If an indicator lights continuously or flashes, the following possible causes may be considered:

Symptom	Possible Cause	Check/Remedy
FV-200RF-AS's Fault indicator lights red.	<ul style="list-style-type: none"> • Number of RM-200M setting is wrongly set in FV-200RF-AS. • Wrong connection between RM-200M and FV-200RF-AS. 	<ul style="list-style-type: none"> • Confirm that the number that has been set using the setting switch agree with the actual number of the connected RM-200M units. • Confirm that the RM-200M's address is set correctly. • Confirm that there is no fault with the wiring leading to the RM-200M.
RM-200M's Fault indicator flashes yellow.	Communication with the FV-200RF-AS is not being performed correctly, or equipment failures may have occurred.	<ul style="list-style-type: none"> • Confirm that the number of units that has been set using the FV-200RF-AS's setting switch agrees with the actual number of the RM-200M units connected. • Confirm that the unit has the correct address settings. • Confirm that there is no fault with the wiring leading to the FV-200RF-AS.

[FV-224PA-AS]

If overheat failure happens, Fault indicator lights red.



If an indicator lights continuously, the following possible causes may be considered:

Check the following points if the indicator automatically goes out within 30 minutes after it has lit.

- Check installation conditions for appropriate ventilation.
- Check the connected load capacity for possible overload.
- Check input and output cables are installed correctly.

[FV-248PA-AS]

If overheat failure happens, Fault indicator lights red.



If an indicator lights continuously, the following possible causes may be considered:

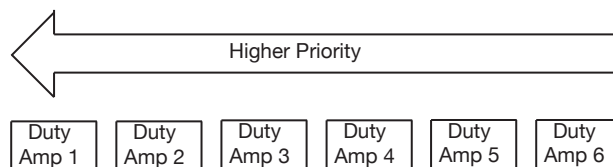
Check the following points if the indicator automatically goes out within 30 minutes after it has lit.

- Check installation conditions for appropriate ventilation.
- Check the connected load capacity for possible overload.
- Check input and output cables are installed correctly.

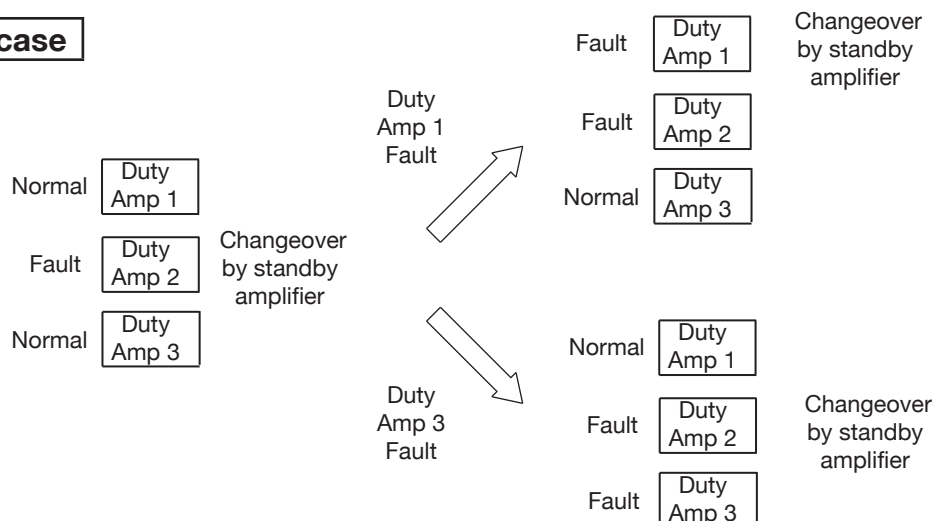
[FV-200CA-AS]

FV-200CA-AS can handle changeover six duty amplifier with one standby amplifier, if standby amplifier replacing one fault duty amplifier then another duty amplifier with higher priority fault the standby amplifier will replace the higher fault duty amplifier instead.

For FV-200CA-AS Failure LED and buzzer Indicator please refer to page 14



Sample case



11. SPECIFICATIONS

11.1. FV-200EV-AS Emergency Message Panel

Power Source	Usable power supply unit : FV-200PS-AS 24 VDC (operating range: 19.5V ~ 27V), M3 Screw terminal
Current Consumption	250 mA (rated) , 160 mA (standby)
Emergency Announcement	Alert (repeated continuously) Evacuation (repeated continuously) False (repeated continuously) Clear (repeated continuously)
Audio Input	Fireman's microphone (accessory):-55dB, 600 Ω, unbalanced, XLR connector
Audio Output	EV : -20 dB*, unbalanced, Removable terminal block (2 pins)
Control Input	FA Input : No-voltage make contact input, open voltage: 24 VDC, short-circuit current: Under 5 mA, Removable terminal block (2pins)
Frequency Response	20 Hz ~ 20 kHz, ±3 dB, 1 kHz
Distortion	Under 1% (1kHz, rated output)
Control Output	EV : Contact Switch (Normally Open), Removable terminal block (2 pins) Emergency ON output : Relay contact output, rated voltage: 24 VDC, (at 4 contacts), Removable terminal block (2 pins)
Operation	Alert announcement button Evacuation announcement button False announcement button Clear announcement button Stop announcement button
LED Indicator	Power(Green) Fire(Red) Alert announcement(Green) Evacuation announcement(Green) False announcement(Green) Clear announcement(Green) USB(Green)
Wave Format	44.1 kHz sampling frequency, 16 bit PCM (monaural)
Recording System	USB data transfer from rear panel
Maximum Recording Time	6 min(use built in memory), if use big file size then could use SD card inside unit.
Operating Temperature	0°C to +40°C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel: Aluminium, black, alumite
Dimensions	482 (W) × 88.4 (H) × 336(D) mm
Weight	4.3 kg (With microphone)

Note :

* 0 dB = 1V

- Specifications measured at DC 24 V.
- The design and specification are subject to change without notice for improvement.

• Accessory

- Removable terminal plug (2pins)..... 7
- Fireman's microphone 1

11.2 FV-200PP-AS Pre Amplifier Mixer Panel

Power Source	Usable power supply unit : FV-200PS-AS 24 VDC (operating range: 19.5 V ~ 27 V), M3 Screw terminal
Current Consumption	110 mA (rated), 70 mA (standby)
Audio Input	EV: -20 dB*, 600 Ω, unbalanced, Removable terminal block (2 pins) Timer: -20 dB*, 600 Ω, unbalanced, Removable terminal block (2 pins) Paging: -60/-20 dB* (selectable), 600 Ω, balanced, Removable terminal block (3 pins) RF Link: 0 dB*, 600 Ω, unbalanced, Removable terminal block (2 pins) MIC/LINE INPUT 1 : -60 dB/ -20 dB* (selectable), 600 Ω, balanced, Removable terminal block (3 pins) MIC/LINE INPUT 2-4: -60 dB/-20 dB* (selectable) , 600 Ω, balanced, Removable terminal block (3 pins) AUX1,2: -20 dB*, 10k Ω, unbalanced, RCA Jack
Audio Output	Priority output: 0 dB*, balanced, Removable terminal block (3 pins) BGM output: 0 dB*, balanced, Removable terminal block (3 pins)
Frequency Response	50 ~15 kHz, ±3 dB, 1 kHz
Muting	MIC/INPUT1 : Mutes other input signals(Mic/Line2~4, AUX1~2) by 0 ~ 30dB attenuation
Phantom Power	MIC/INPUT1 (selectable) (+21VDC)
Priority Control	Fireman's microphone > EV > Timer > Paging > Remote microphone > Mic / Line1 > Mic / Line2~4 & AUX1-2
Tone Control	Bass : - 10dB at 100Hz, + 10dB at 100Hz (for INPUT BGM) Treble : - 10dB at 10kHz, + 10dB at 10kHz (for INPUT BGM)
S/N Ratio	Over 60 dB
Distortion	Under 1% (1kHz, rated output)
LED Indicator	Power (Green)
Control Input	Timer: No-voltage make contact input, open voltage: 24 VDC, short-circuit current: Under 5 mA, Removable terminal block (2 pins) Paging: No-voltage make contact input, open voltage: 24 VDC, short-circuit current: Under 5 mA, Removable terminal block (2 pins) EV: No-voltage make contact input, open voltage: 24 VDC, short-circuit current: Under 5 mA, Removable terminal block (2 pins) RF: No-voltage make contact input, open voltage: 24 VDC, short-circuit current: Under 5 mA, Removable terminal block (2 pins)
Control Output	All Call : Contact Switch (Normally Open), Removable terminal block (2 pins)
Operating Temperature	0°C to +40 °C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel: Aluminium, black, alumite
Dimensions	482 (W) × 88.4 (H) × 353.3 (D) mm
Weight	4.2 kg

Note:

* 0 dB = 1V

- Specification measured at DC 24 V.
- The design and specification are subject to change without notice for improvement.

• Accessory

Removable terminal plug (2 pins)···7

Removable terminal plug (3 pins)···8

11.3 FV-200RF-AS Remote Microphone Receiver Panel

Power Source	Usable power supply unit : FV-200PS-AS 24 VDC (operating range: 19.5V ~ 27V), M3 Screw terminal
Current Consumption	230mA (rated), 130 mA (standby)
No. of Zone Groups in Speaker Selector	Max. 10(SS-2010, SS-1010R, SS-1010)
Control Output	55 outputs, No-voltage make contact output, removable terminal block (6 pins)
Priority Control for Remote Microphone	Last-in-1st-out priority/1st-in-1st-out priority/individual priority (selectable)
Audio Output	0 dB*, unbalanced, Removable terminal block (2 pins)
Usable Remote Microphone	RM-200M Remote microphone extension unit : RM-210 (Max.4 unit)
No. of Connectable to Remote Microphone	Max. 4, RJ-45 Connector
Maximum Cable Distance	Total 800 m
S/N Ratio	Over 60 dB
Distortion	Under 1% (1kHz, rated output)
LED Indicator	Power (Green) , Error (Red)
Operating Temperature	0°C to +40°C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel: Aluminium, black, alumite
Dimensions	482 (W) × 44 (H) × 320 (D) mm
Weight	2.8 kg

Note:

* 0 dB = 1V

- Specification measured at DC 24V
- The design and specification are subject to change without notice for improvement.

• **Accessory**

Removable terminal plug (2 pins)	2
Removable terminal plug (3 pins)	1
Removable terminal plug (6 pins)	10

11.4 FV-200CA-AS Changeover Amplifier Panel

Power Source	Usable power supply unit : FV-200PS-AS 24 V DC (operating range : 21.6 ~ 26.4 V), M3 screw terminal
Current Consumption	240 mA
No. of Input Channel	6 Duty Amplifiers, 1 Standby Amplifier
No. of Output Channel	6 Outputs
Failure Detection	Fault Buzzer with Buzzer CTRL switch
Display	Power indicator (Green), Changeover indicator (Orange), Fault indicator (Red) Buzzer CTRL indicator (Red)
Operating Temperature	0°C to +40°C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel : Alumunium, black, alumite
Dimensions	482 (W) X 44 (H) X 343.2 (D) in mm
Weight	2.6 kg

Note:

- Specification measured at DC 24V
- The design and specification are subject to change without notice for improvement.

• Accessory

Removable terminal plug (2 pins)	3
Removable terminal plug (8 pins)	4

11.5 FV-224PA-AS 240W Power Amplifier Panel

Power Source	AC: 220 ~ 230 V AC, 50/60Hz DC: 24 V DC (operating range: 19.5V ~ 27V) M4 screw terminal, distance between barriers: 12 mm
Power Consumption	AC at rated output : 565W (Condition : AC 230 V) AC at no signal : 22 W IEC60065 : 245W
Current Consumption	DC at rated output : 15 A (Condition : DC 27 V) DC at no signal : 0.3 A IEC60065 : 5.8 A
Rated Output	240 W
Input	2 inputs, 0 dB*, 20 k Ω , balanced, removable terminal plug (3 pins) Input module VP-200VX (Option)
Impedance	21 Ω (70V), 42 Ω (100V)
Speaker Output	M4 screw terminal, distance between barriers: 12 mm
Control Output	Fault output Make: Normal, Break : Error or Power Off
S/N Ratio	Over 60 dB
Total Harmonic Distortion	Under 1% (1kHz, 1/3 rated output)
Frequency Response	80Hz ~ 15kHz, \pm 3dB, 1kHz
Ventilation	Fan Cooling
Panel Indicator	Power (Green) Signal (Green) Peak (Red) Fault (Red)
Operating Temperature	0 °C to +40 °C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel: Aluminium, black, alumite
Dimensions	482 (W) x 88.4 (H) x 337.2 (D) mm
Weight	13.4kg

Note:

* 0 dB = 1V

- Specification measured at AC 230 V AC, 50 Hz.
- The design and specification are subject to change without notice for improvement.

• **Accessory**

Removable terminal plug (3 pins) 3

• **Option**

VP-200VX Input module.

11.6 FV-248PA-AS 480W Power Amplifier Panel

Power Source	AC: 220 ~ 230 V AC, 50/60Hz DC: 24 V DC (operating range: 19.5V ~ 27V) M4 screw terminal, distance between barriers: 12 mm
Power Consumption	AC at rated output : 1110 W (Condition : AC 230 V) AC at no signal : 44 W IEC60065 : 480 W
Current Consumption	DC at rated output : 30 A (Condition : DC 27V) DC at no signal : 1.0 A IEC60065 : 10.9 A
Rated Output	480W
Input	2 inputs, 0 dB*, 20 k Ω , balanced, removable terminal plug (3 pins) Input module VP-200VX (Option)
Impedance	10 Ω (70V), 21 Ω (100V)
Speaker Output	M4 screw terminal, distance between barriers: 12 mm
Control Output	Fault output Make: Normal, Break : Error or Power Off
S/N Ratio	Over 60 dB
Total Harmonic Distortion	Under 1% (1kHz, 1/3 rated output)
Frequency Response	80Hz ~ 15kHz, \pm 3dB, 1kHz
Ventilation	Fan cooling
LED Indicator	Power (Green) Signal (Green) Peak (Red) Fault (Red)
Operating Temperature	0 °C to +40 °C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel : Aluminium, black, alumite
Dimensions	482 (W) x 132 (H) x 333.2 (D)mm
Weight	18.5 kg

Note:

* 0 dB = 1V

- Specification measured at AC 230 V AC, 50 Hz.
- The design and specification are subject to change without notice for improvement.

• Accessory

Removable terminal plug (3 pins) 3

• Option

VP-200VX Input Module

11.7 VP-200VX Power Amplifier Input Module

Power Source	Supplied from FV-224PA-AS, FV-248PA-AS
Power Consumption	Under 30 mA
Power Amplifier Link	RJ-45 female connector for connecting the VX-200SP or VX-200SZ audio output module or SX-2100AO audio output unit. Twisted-pair cable (TIA/EIA-568A standard).
Finish	Panel: Surface-treated steel plate.
Dimensions	88(W) x 25.8(H) x 73.2(D) mm
Weight	50 g
Applicable Model	FV-224PA-AS, FV-248PA-AS

Note:

The design and specification are subject to change without notice for improvement.

11.8. RM-200M Remote Microphone

Power Source	24 V DC (operating range: 14 ~ 28 V DC) Power input jack: Non-polarity type Usable power input plug* ¹ : Outer diameter ø5.5 mm, inner diameter ø2.1 mm, length 9.5 mm
Current Consumption	100 mA or less
Audio Output	0 dB* ² , 600 Ω, balanced
Frequency Response	100 Hz ~ 20 kHz
Distortion	1% or less
S/N Ratio	60 dB or more
Microphone	Unidirectional electret condenser microphone
Function Key	Key numbers : 11 Function : Selecting zone from 1~10 and select "All Call"
Volume Control	Microphone volume control
Connection and Cable Connector	Category 5 Shielded Twisted-Pair straight cable, RJ45 connector
Finish	ABS resin, blueish gray (PANTONE 538 or its equivalent)
Dimensions	190 (W) x 76.5 (H) x 215 (D) mm (Gooseneck microphone excluded)
Weight	750 g

Note:

* 1 Use the AC adapter AD-246 or equivalent.

* 2 0 dB = 1 V

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

• Accessory

Link cable (3 m) 1

• **Optional**

Wall-Mounting Bracket : WB-RM200

11.9 RM-210 Remote Microphone Extension

Current Consumption	20 mA max. (in terms of RM-200M's DC power input)
Connection	Connection to RM-200M by way of dedicated cable
Number of Function Keys	10
Finish	ABS resin, blueish gray (PANTONE 538 or its equivalent)
Dimensions	110 (W) x 76.5 (H) x 215 (D) mm
Weight	350 g

Note:

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

• **Accessories**

Extension cable 1

Linkage bracket A 2

Linkage bracket B 1

Screw for linkage bracket 12

• **Optional**

Wall-Mounting Bracket : WB-RM200

11.10 FV-200PS-AS DC Power Supply Panel

Power Source	220 ~ 230 V AC, 50/60 Hz 24 V DC (19.5 ~ 27 V), M3 screw terminal
Power Consumption	160 W (275 VA) at rated power output (AC operation)
Output	AC Operation : 24 V DC \pm 0.5, 5 A (total) AC Operation : Voltage lowering DC input voltage approx. by 2 V M3 screw terminal
Display	AC Power Indicator (Green), DC Power Indicator (Orange)
Operating Temperature	0 C to +40°C
Operating Humidity	Under 90% RH (no condensation)
Finish	Panel Alumunium, Black, Alumite
Dimensions	482 (W) X 44 (H) X 335 (D) mm
Weight	3.2 kg

Note:

- Specification measured at 230 V AC, 50 Hz.
- The design and specification are subject to change without notice for improvement.

● **Accessory**

Power Cord (1.8 m)	1
Fuse (6.3 A)	1

