

# Operation Manual

Public Address Mixing Amplifier  
**PA-212/224**



# Welcome

## A personal welcome to you from the management and employees of Inter-M

All of the co-workers here at Inter-M are dedicated to providing excellent products with inherently good value, and we are delighted you have purchased one of our products.

We sincerely trust this product will provide years of satisfactory service, but if anything is not to your complete satisfaction, we will endeavor to make things right.

Welcome to Inter-M, and thank you for becoming part of our worldwide extended family!



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.

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

## WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Attentions: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant on une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.  
Pour deconnecter complètement l'appareil du reseau d'alimentation. deconnecter le cordon d'alimentation de la prise murale.  
La prise du reseau d'alimentation doit demeurer aisement accessible.

\*WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING-WATER AND MOISTURE: Unit should not be used near water(e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so than objects do not fall and liquids are not spilled into the enclosure through openings.

\*CLASS 2 WIRING (Adjacent to speaker terminal): The speaker output of this apparatus can exceed 10 Watts and could be a shock injury. Connection to speakers should be performed by a skilled person.

\*Do not install this equipment in a confined space such as a book case or similar unit.

\*Warning : To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.

\*This apparatus shall be connected to a mains socket outlet with a protective earthing connection.

\*To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.

\*The mains plug of the power supply cord shall remain readily accessible.

## CAUTION

\*These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

## NOTE

\*This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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## Unpacking

Although your PA-206/212/224 is neither complicated nor difficult to operate, we recommend you take a few minutes to read this brief manual and familiarize yourself with the important information regarding product features, setup and operation.

As with most electronic devices, we strongly recommend you retain the original packaging. In the unlikely event the product must be returned for servicing, the original packaging (or reasonable equivalent) is required.

## Installation

### Environment

Never place this product in an environment which could alter its performance or reduce its service life. Such environments usually include high levels of heat, dust, moisture, and vibration.

## IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



## Overview

PA-206/212/224 are designed to have higher output and a compact size by Class-D design. They are configured with the models having respectively 60W/120W/240W of output, and can be used as High-Z (100V/70V) and Low-Z (8Ω/4Ω). PA series are designed to allow the stable operation for voice play and BGM application, and provide the ideal solution to various places like hospitals, restaurants, and schools.

## Features

- CLASS-D AMPLIFIERS HAVING 60W/120W/240W OF OUTPUT  
\* PA-206: 60W, PA-212: 120W, PA-224: 240W
- HIGH-Z (100V/70V) AND LOW-Z (8Ω/4Ω)
- MULTIPLE INPUTS (THREE MICS/LINES, TWO LINES, TWO STEREO/LINE INPUTS, TEL IN, USB) AND A FEATURE FOR CONTROLLING THE VOLUME OF EACH CHANNEL
- EXT IN AND MIX OUT
- DISPLAYING INPUT SIGNAL LED BY CHANNEL AND OUTPUT LED LEVEL
- TONE(BASS/TREBLE) CONTROLLING
- A SWITCH FOR SELECTING 5 SWITCHES (ZONE SELECTION SWITCH)
- BROADCASTING IN PRIORITY (TEL IN > INPUT 1 > INPUT 2 = INPUT 3 = INPUT 4 = INPUT 5 = INPUT 6)
- EXTERNAL MUTE AND EXTERNAL CHIME
- CHIME AND SIREN

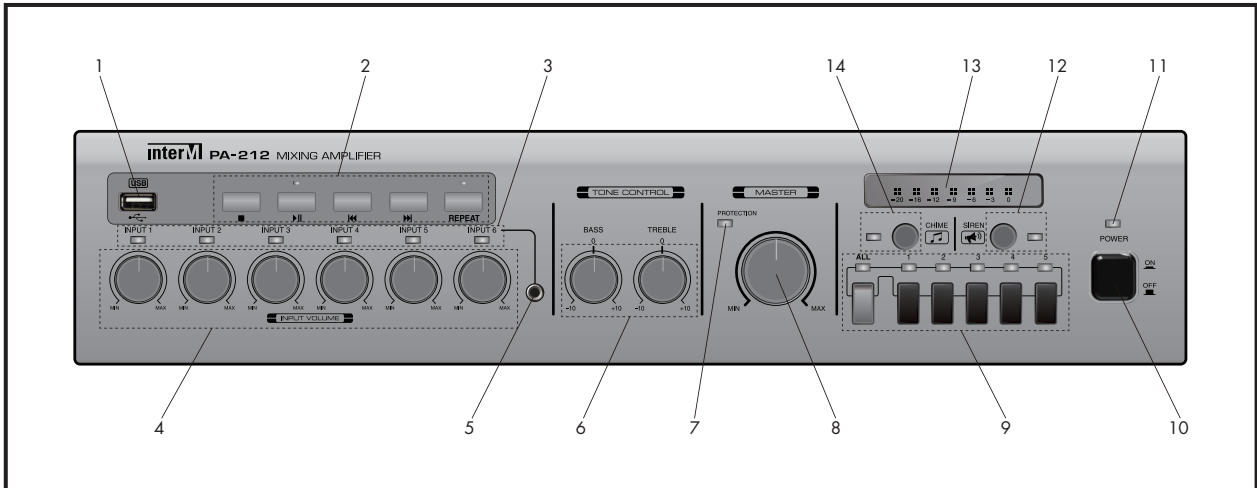
## Contents and Accessories

1. Washer for Rack Mount x 4EA
2. Screw for Rack Mount x 4EA
3. AC power cord x 1EA
4. 3P Terminal Block x 8EA
5. 4P Terminal Block x 1EA
6. Operation manual x 1EA

## Operation

1. Before you plug the power cord to AC outlet, please set the power switch OFF, tone Control center, and volume level minimum.
2. Please make sure the speakers and input jacks are properly connected before turn the power switch on.
3. Be sure the AC power is correct voltage before you plug into the power cord. (AC 220V, 230V, 240V, 50/60Hz)
4. Please push the power switch, then the power input led is on and the unit will be operated.
5. Please use your own with adjustment the volume using each input volume and master volume, the tone using the tone control.

## Front Panel



### 1. USB SLOT

Please use your own with adjustment the volume using each input volume and master volume, the tone using the tone control.

Support file systems	The maximum number of playable files
FAT16	512 Files
FAT32	65535 Files
NTFS	Not Supported
OUTPUT	5V $\approx$ 0.5A

### 2. USB PLAY MODE SELECTION BUTTON

- 1) ■ Button: Press the button to stop the audio file currently being played.
- 2) ►|| Button: Press the button to play or pause the audio file.  
When LED is turned on (by pressing the button once): Current audio file is played.  
When LED blinks (by pressing the button twice): The audio file which is currently being played is paused.
- 3) |◀◀ Button: Press the button briefly to move to the previous audio file. Press and hold the button for more than 2 seconds to rewind.
- 4) ▶▶| Button: Press the button briefly to move to the next audio file. Press and hold the button for more than 2 seconds to fast forward.
- 5) REPEAT Button: Press the button to play the audio file repeatedly.
  - ① When Led is turned off: All audio files are played repeatedly.
  - ② When LED is turned on (by pressing the button once): Those files stored in the folder with currently playing audio file are played repeatedly.
  - ③ When LED blinks (by pressing the button twice): Only the currently playing audio file is played repeatedly.

### 3. INPUT SIGNAL INDICATOR

If there is an input signal to INPUT 1~6, due input signal indicator lights up.

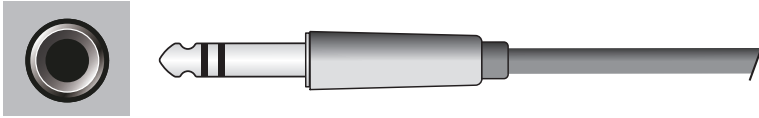
**4. INPUT VOLUME CONTROLLER**

It is a controller to control the volume of INPUT 1~6. Use by controlling to desired volume.

※ Set the controllers of unused input terminals to minimum.

**5. AUX INPUT TERMINAL (INPUT 6)**

It is an AUX input terminal of INPUT 6. Refer to the below picture for the cable needed to the terminal.

**6. TONE CONTROLLER**

It is a controller to control BASS (100Hz) and TREBLE (10kHz). Users can control to their desired tones.

**7. PROTECTION CIRCUIT INDICATOR**

It is an indicator to display the operation status of protection circuit inside the device. When the indicator turns on, the output is blocked.

**8. MAIN VOLUME CONTROLLER**

It is a controller to control the volumes of whole signals controlled by each input volume controller. When turning clockwise, the volume increases.

**9. SPEAKER SELECTION SWITCH**

It is a switch to turn ON/OFF the signals printing with five speaker output terminals or to turn ON/OFF whole output signals with an ALL switch. In the event of speaker output ON, a upper indicator of switch lights up.

※ Turn off the selection switch for unused speaker.

**10. POWER SWITCH**

It is a switch to turn on/off the power.

**11. POWER INDICATOR**

It is an indicator to display the status of power. When the power switch is ON, the indicator turns on.

**12. SIREN ON/OFF SWITCH**

It is a switch to turn ON/OFF the siren. When pressing once, the siren turns ON and when pressing once again, it turns OFF. While the siren is operating, a siren indicator on the right side of the switch lights up.

**13. OUTPUT LEVEL INDICATOR**

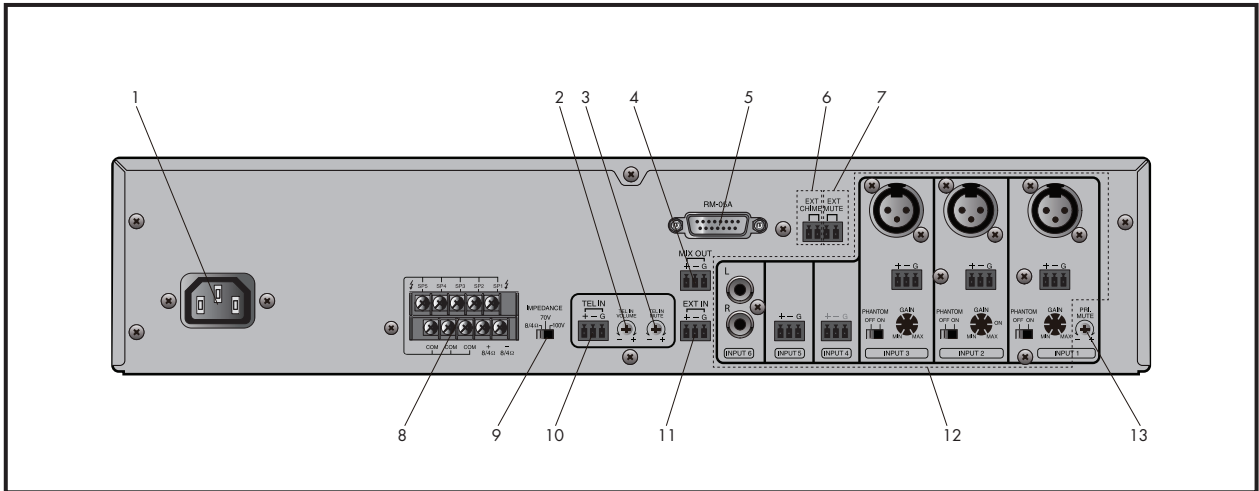
It is an indicator to indicate the level of the signal being printed. Output level is indicated with 3 - 4dB interval.

**14. CHIME SWITCH**

It is a switch to sound 4-note scale of chime. While chiming, a chime indicator on the left side of the switch lights up.



## Rear Panel



### 1. AC INPUT

It is a terminal to supply power to this device. The power used for this is AC 220V, 230V, 240V, 50/60Hz. Do not bend by force, pull, twist, heat, or cut the power cord. It may cause a fire or electric shock by damaging the cord.

### 2. TEL IN VOLUME CONTROLLER

It is a controller to control the volume of TEL IN input. Use by controlling to desired volume.

### 3. TEL IN PRIORITY CONTROL VOLUME (TEL IN MUTE)

This is a volume that adjusts the volume of INPUT 1, CHIME, and SIREN sound when a signal is input to the TEL IN. By using TEL IN priority adjustment volume, user can adjust the input signal to INPUT 1, CHIME, and SIREN. By using priority adjustment volume of INPUT 1, user can adjust the volume of INPUT 2~6, EXT IN.

### 4. MIX OUTPUT (MIX OUT) TERMINAL

It is an output terminal to connect when recording the sound printed from this device or using other amps in parallel. It is a balanced type and pin arrangements are +, -, G.

### 5. RM-05A CONNECTION TERMINAL

It is a terminal to use by connecting our RM-05A. Pin arrangement of the terminal is as follows.



Pin 1: Remote amplifier input signal hot (+)	Pin 9: Remote control ground
Pin 2: Remote amplifier input signal cold (-)	Pin 10: DC +24V
Pin 3: Signal ground	Pin 11: Remote chime
Pin 4: Remote control 1 (SP1)	Pin 12: NC
Pin 5: Remote control 2 (SP2)	Pin 13: NC
Pin 6: Remote control 3 (SP3)	Pin 14: NC
Pin 7: Remote control 4 (SP4)	Pin 15: NC
Pin 8: Remote control 5 (SP5)	

**6. EXTERNAL CHIME (EXT CHIME) SWITCH TERMINAL**

It is a terminal to connect the switch when operating the 4-note scale chime of this device on the outside. When the contact closure comes in external chime switch terminal, 4-note scale chime operates.

**7. EXTERNAL MUTE SWITCH TERMINAL**

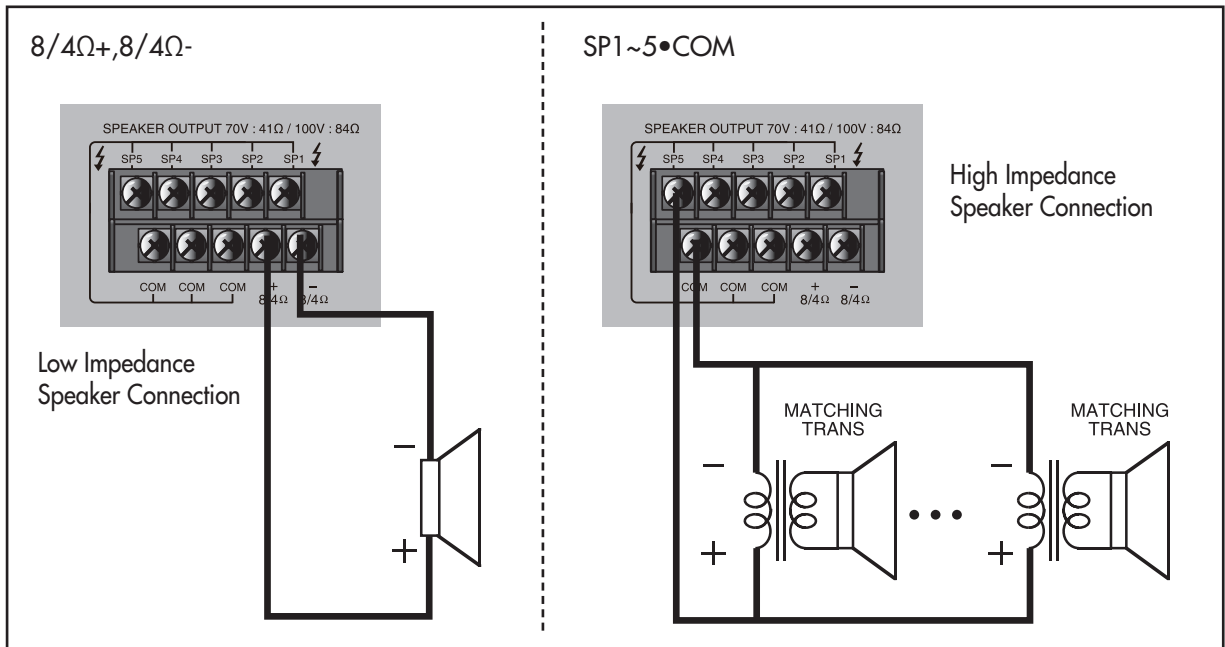
It is a terminal to connect the switch when operating the degree that the sound of INPUT 1 – 6, CHIME, EXT IN are decreasing in this device. When the contact closure comes in External MUTE switch terminal, the sound of INPUT 1~6, CHIME, SIREN, EXT IN decreases as much as the volume controlled with the TEL IN priority control volume and priority control volume (PRIORITY MUTE).

**8. SPEAKER OUTPUT TERMINAL**

It is a terminal to use when connecting the speaker. When connecting the speaker, use not to be in overload state.

- ※ You can control SP1 - 5 terminal with the speaker selection switch on the front side.
- ※ Be careful not to use 8/4Ω terminal and SP1 - 5 terminal (high-impedance speaker terminal) simultaneously.

When connecting the speaker, connect the speaker to use to the speaker terminal on the rear panel in accordance with the following connection after removing the power cord from the outlet.



- ※ Caution: Be careful not to make total impedance of the speaker terminal to be lower than defined impedance in any case. Impedance and output voltage are as the following table.

	8/4Ω	SP1~5•COM terminal	
PA-206	8/4Ω	100V/167Ω	70V/82Ω
PA-212	8/4Ω	100V/84Ω	70V/41Ω
PA-224	8/4Ω	100V/42Ω	70V/21Ω

- ※ Caution: Select the impedance selection switch to use before connecting the speaker.
- ※ Caution: Be careful not to use 8/4Ω terminal and SP1 - 5 terminals simultaneously.

## 9. IMPEDANCE SELECTION SWITCH

It is a switch to select the impedance before connecting the speaker. Select the impedance to use among 8/4Ω, 70V, 100V.

## 10. TEL IN INPUT TERMINAL

It is a terminal to use by connecting with the telephone exchange. You can broadcast directly with the transmitter of phone.

- ※ When a signal is input to the TEL IN input terminal, all other input signals will be lower as set by the TEL IN priority adjustment volume and the priority adjustment volume.

## 11. EXTERNAL INPUT (EXT IN) TERMINAL

It is an input terminal to connect the output terminal of the external device when extending the input of this device. It is a balanced type and pin arrangements are +, -, and G.

## 12. INPUT TERMINAL OF INPUT 1~6

It is an input terminal of INPUT 1~6. INPUT 1~5 is configured with a balanced input circuit and INPUT 6 is configured with a RCA jack.

### 1) Input terminal of INPUT 1~3

- PHANTOM switch: When turning the switch ON, DC 15V of phantom power is supplied to use with condenser mic input.
- INPUT GAIN volume: It is a volume to control GAIN of the input signal. If you set the volume to minimum, a signal of -20dbu (77.46mVrms) can be input; if you set the volume to maximum, a signal of -70dbu (244.9μVrms) can be input.
- ※ Do not use XLR jack and Euro Terminal of INPUT 1~3 simultaneously as they are connected from the inside.

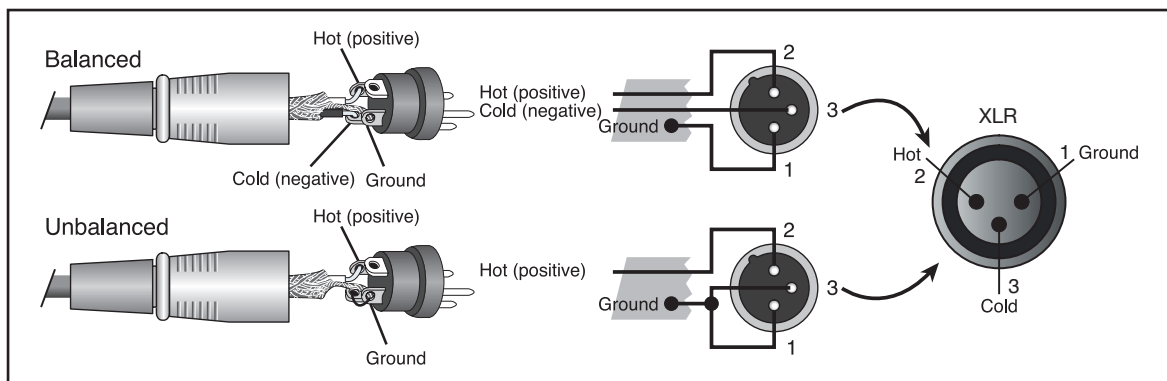
### 2) Input terminal of INPUT 4~5

They can be used with LINE input.

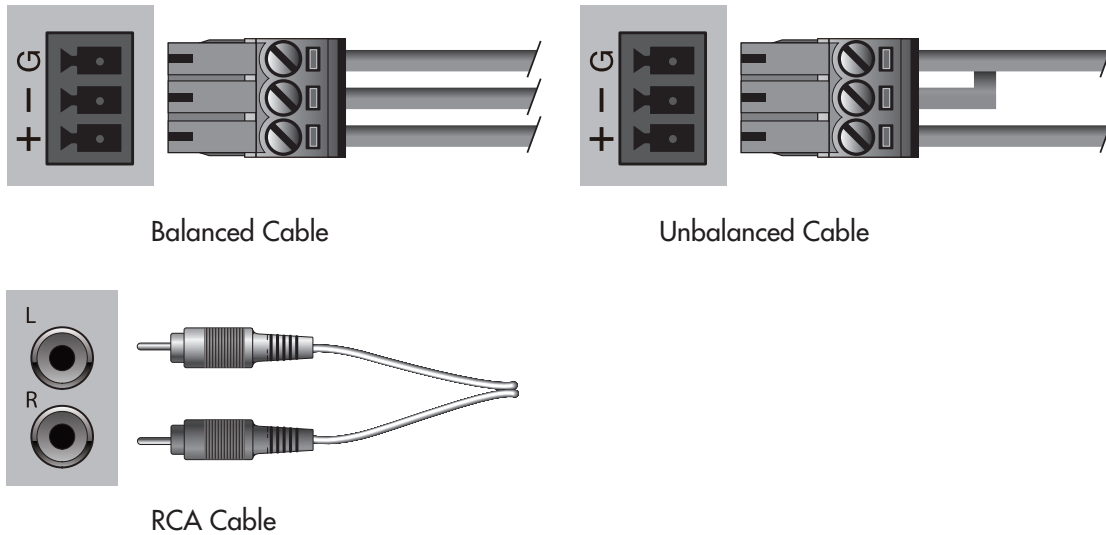
### 3) Input terminal of INPUT 6

Connect it with the audio source device having STEREO output.

- ※ Do not use AUX input terminal of INPUT 6 on the front side and INPUT 6 terminal on the rear side simultaneously as they are connected from the inside.
- ※ Refer to the following for the connection of XLR jack, Euro Terminal, and RCA jack.



Turn PHANTOM switch OFF if using the unbalanced cable.

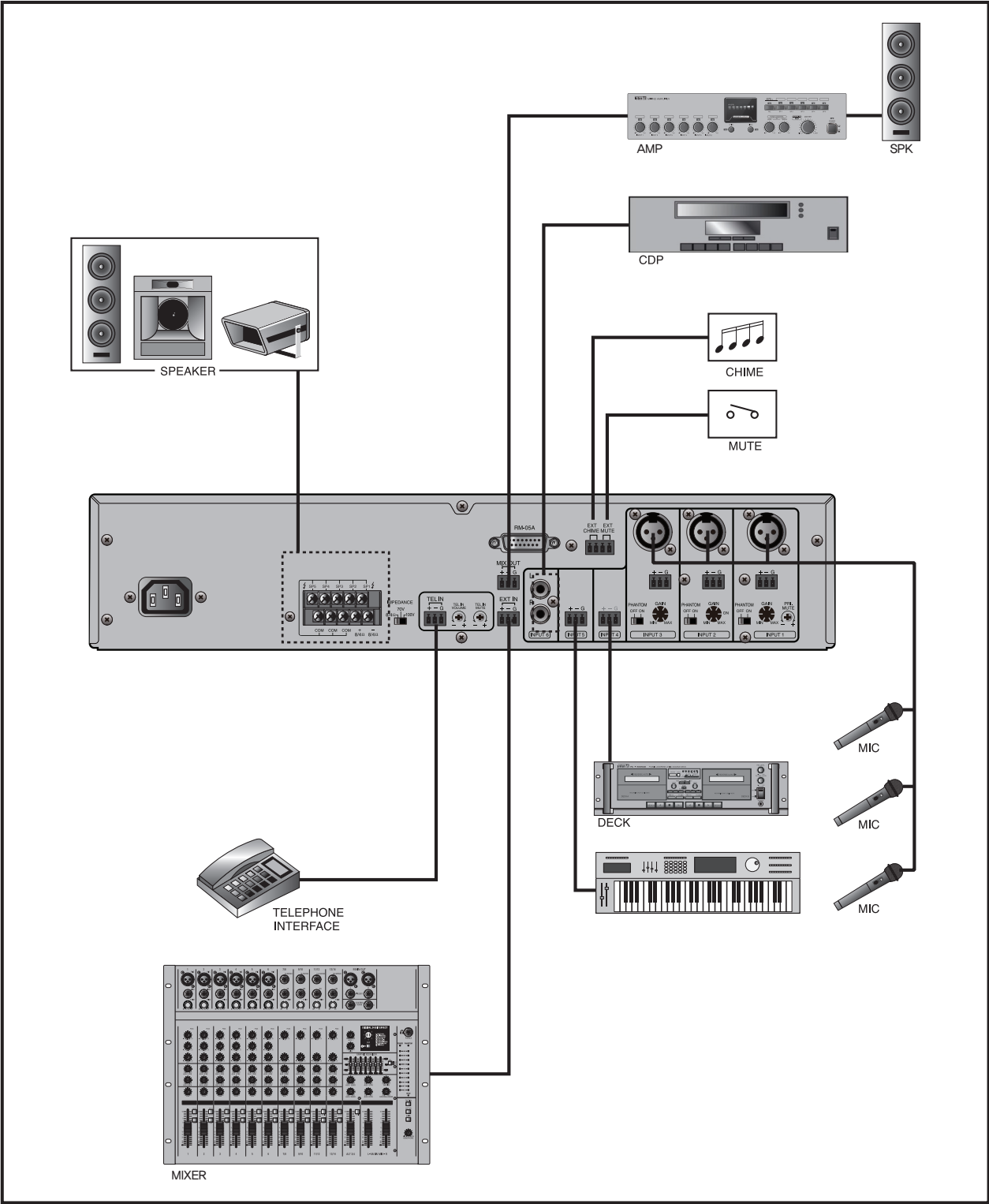


### 13. PRIORITY CONTROL VOLUME (PRIORITY MUTE)

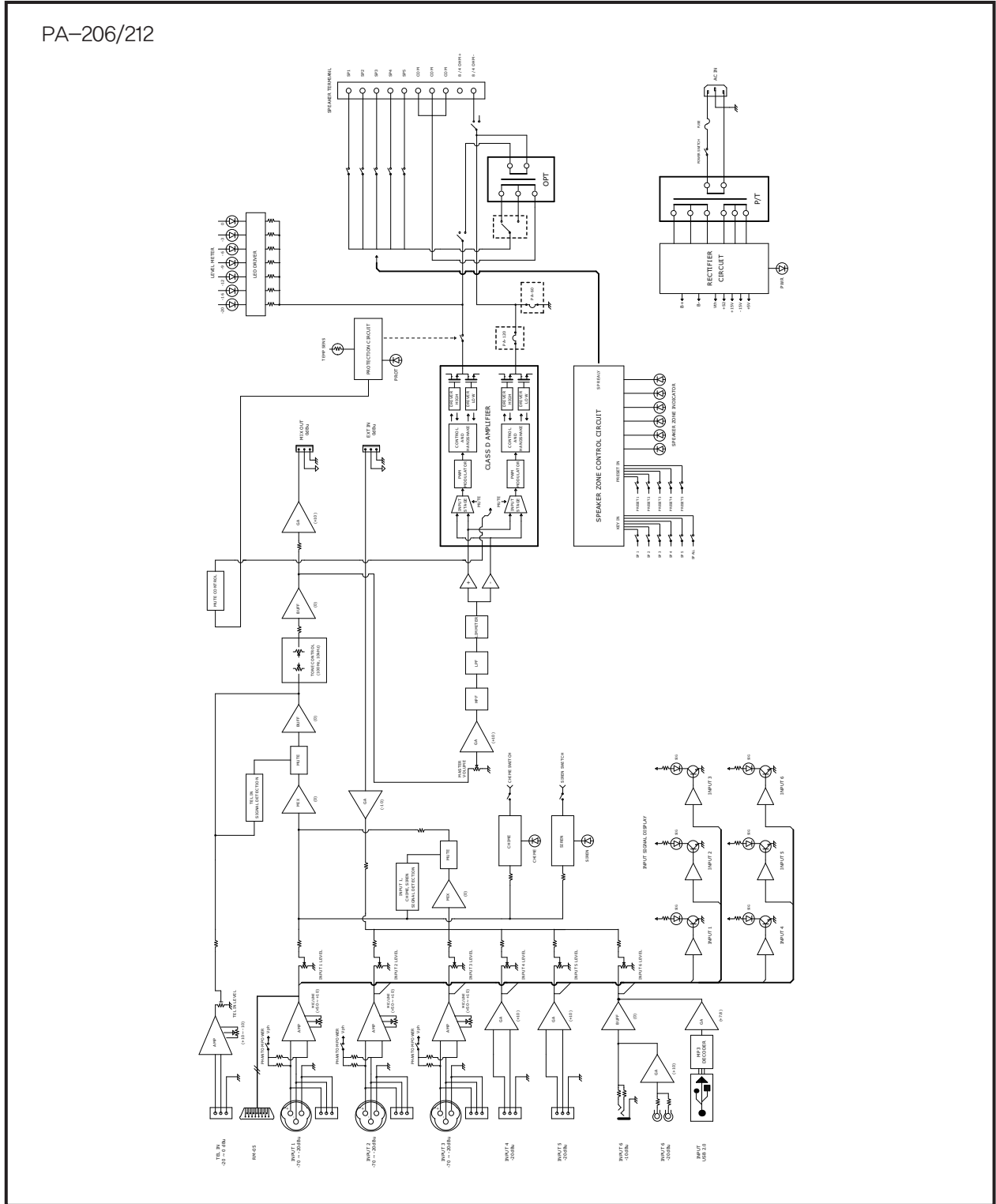
This is a volume that adjust the volume of INPUT 2~6 and EXT IN when the device is operated by the below status.

- 1) When a signal is input to INPUT 1, or CHIME and SIREN is operated
  - 2) When external MUTE switch is operated
  - 3) When a signal is input to TEL IN input terminal
- ※ The broadcasting of INPUT 1, CHIME, and SIREN signals are printed in priority rather than INPUT 2~6, EXT IN.

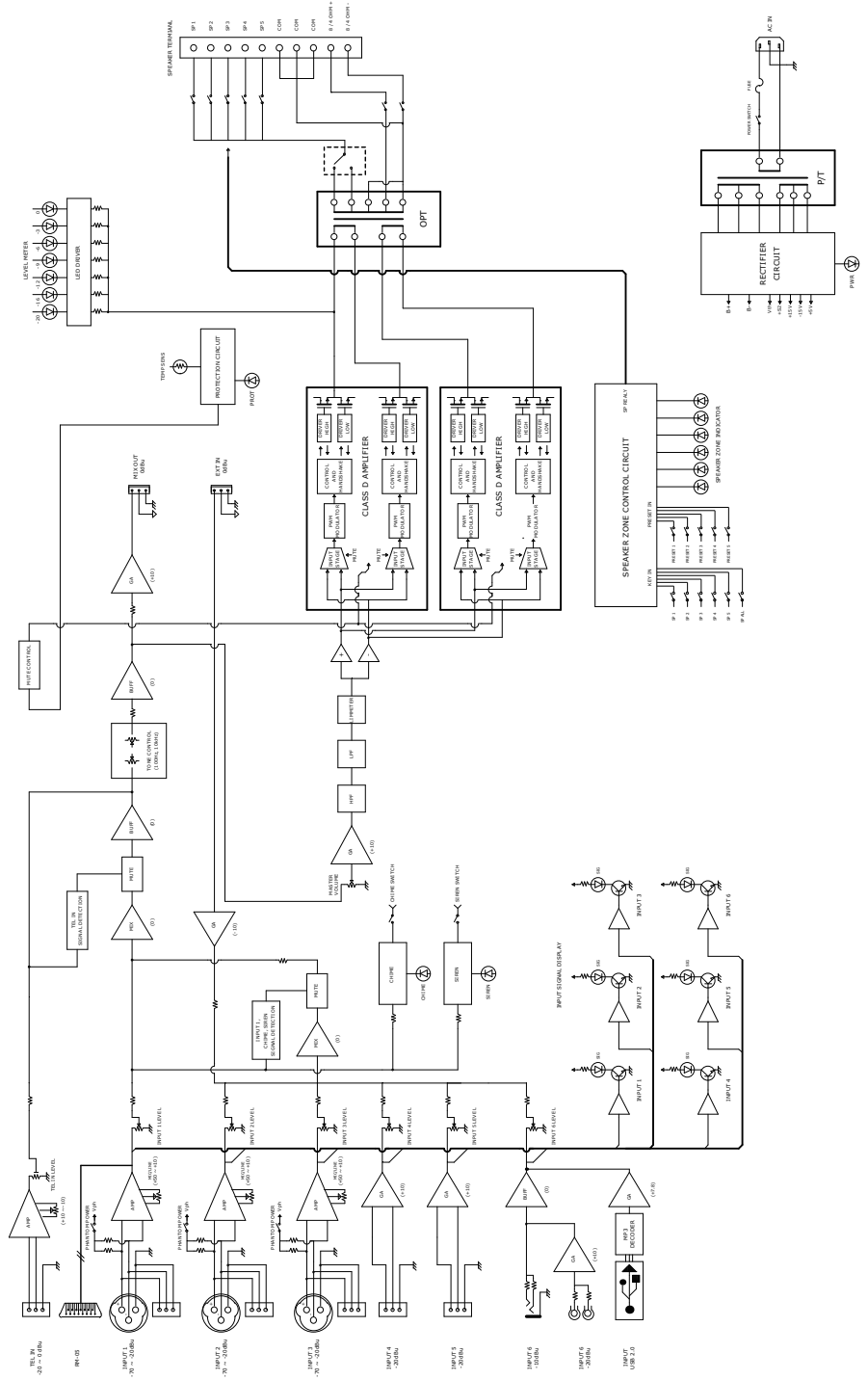
# Applications



# Block Diagram



PA-224



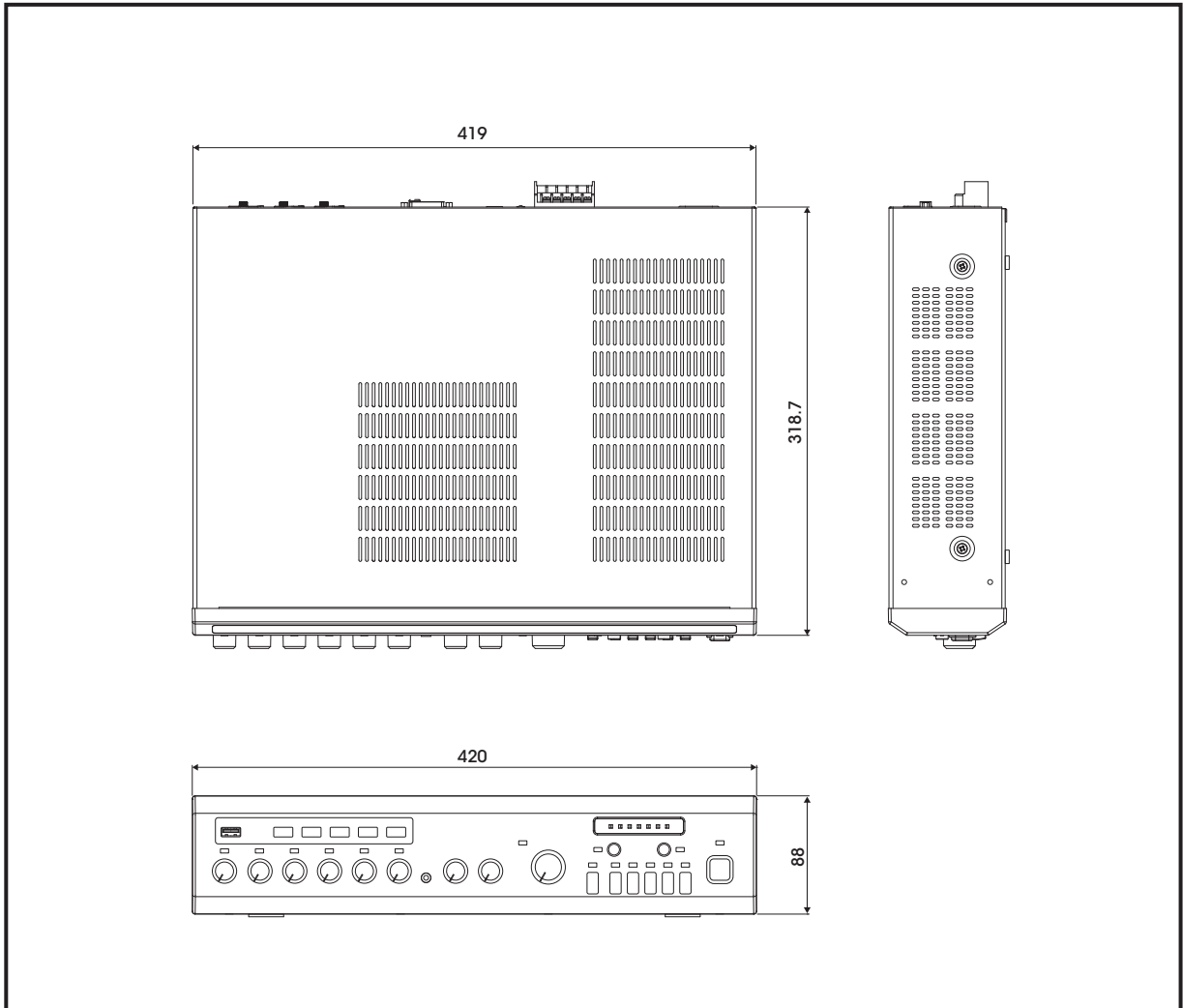
## Specifications

		PA-206	PA-212	PA-224	
Output Power (1kHz, THD. 1%)		15.5V(4Ω)	31V(8Ω)	31V(4Ω)	
		70V(82Ω)	70V(41Ω)	70V(21Ω)	
		100V(167Ω)	100V(84Ω)	100V(42Ω)	
S/N	MIC	50dB			
	RCA, 3.5Φ PHONE JACK	70dB			
	LINE, TEL IN	70dB			
Input Sensitivity / Impedance	MIC (BALANCE)	-70dBu /2kΩ			
	LINE (BALANCE)	-20dBu /2kΩ			
	RCA (UNBALANCE)	-20dBu /2kΩ			
	3.5Φ PHONE JACK (UNBALANCE)	-10dBu /10kΩ			
	TEL IN (BALANCE)	-20 ~ 0dBu/10kΩ			
	EXT IN (BALANCE)	0dBu /20kΩ			
	MIX OUT (BALANCE)	0dBu /10kΩ			
THD+N	Rated Power(1kHz)	Less than 1%			
TONE CONTROL	BASS(100Hz)	±10dB			
	TREBLE(10kHz)	±10dB			
Frequency Response (1W,±3dB,Low-Z)	LINE	70V	80Hz-17kHz	80Hz-15kHz	80Hz-17kHz
		100V	80Hz-17kHz		
	MIC	100Hz-15kHz			
Operating Temperature		-10°C~+40°C			
Operating Power		AC 220V, 230V, 240V, 50/60Hz			
Power consumption (1/8W)		40W	60W	90W	
Weight (Set)		6.25kg	7.32kg	9.75kg	
Dimensions (Set)		420(W) x 88(H) x 318.7(D)mm			

\* Design and specification are subject to be changed for the improvement of product quality without pre notice.



※ DIMENSIONS



## Service

### Procedures

Take steps to insure the problem is not related to operator error or other products within the system. Information provided in the troubleshooting portion of this manual may help with this process. Once it is certain that the problem is related to the product contact your warranty provider as described in the warranty section of this manual.

### Schematic

A Schematic is available by contacting your warranty provider.

### Parts List

A Parts List is available by contacting your warranty provider.

## Variations and Options

### Variations

Products supplied through legitimate sources are compatible with local AC power requirements.

### Options

No optional items are available for this product.

## Warranty

Warranty terms and conditions vary by country and may not be the same for all products. Terms and conditions of warranty for a given product may be determined first by locating the appropriate country which the product was purchased in, then by locating the product type.

To obtain specific warranty information and available service locations contact Inter-M directly or the authorized Inter-M Distributor for your specific country or region.