

Operation Manual

Public Address Amplifier
PAM-312/324/336/348



interM

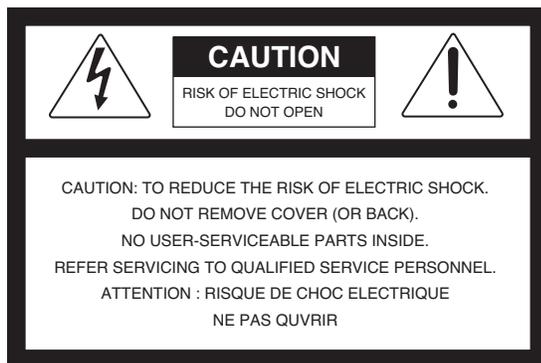
Welcome

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 PAM-312/324/336/348 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.



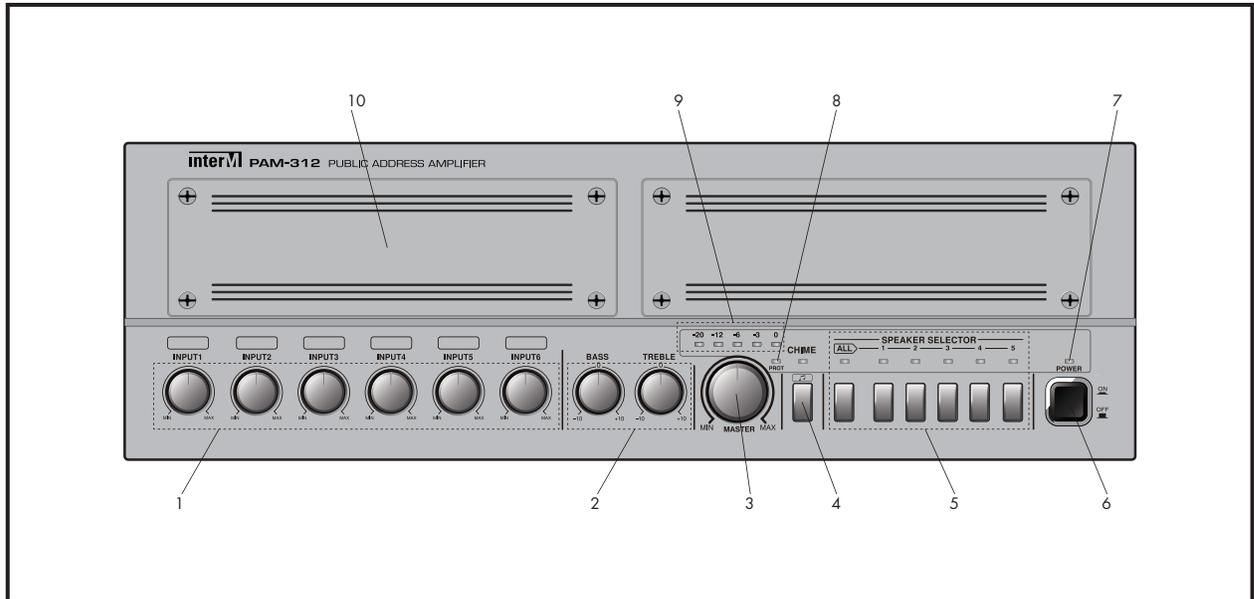
Features

- A CLASS-D AMPLIFIER CAPABLE OF PRODUCING 120W/240W/360W/480W OUTPUT IS ADOPTED. (PAM-312: 120W, PAM-324: 240W, PAM-336: 360W, PAM-348: 480W)
- THE AMPLIFIER PRODUCES HIGH-IMPEDANCE OUTPUT. (100V/70V)
- IT SUPPORTS VARIOUS INPUT TYPES INCLUDING 3 MIC/LINES, 3 LINES, A STEREO INPUT, AND A TEL IN.
- EACH CHANNEL HAS ITS OWN VOLUME CONTROL.
- A MIXED SIGNAL OUTPUT (MIX OUT) IS PROVIDED.
- A TONE (BASS/TREBLE) FUNCTION IS ADOPTED.
- 5-SPEAKER SELECTION SWITCHES ARE PROVIDED.
- EXTERNAL MUTE, EXTERNAL CHIME, AND EM CONTACT CLOSURE FUNCTIONS ARE PROVIDED.
- A 4-TONE CHIME FUNCTION IS PROVIDED.
- AN OUTPUT LEVEL INDICATOR IS PROVIDED.
- A PRIORITY BROADCAST (PRIORITY) FUNCTION IS PROVIDED. THE PRIORITY IS AS FOLLOWS:
 - EM > TEL IN > INPUT 1/RM-05A, INPUT 2, CHIME > INPUT 3/4/5/6, EXT IN, PAM MODULE
- INPUT 1 AND INPUT 2 CAN TURN ON/OFF THE PRIORITY FUNCTION.

Contents and Accessories

1. AC cord x 1EA
2. 3P Terminal Block x 8EA
3. 6P Terminal Block x 1EA
4. User manual x 1EA

Front Panel



1. INPUT VOLUME CONTROL

The knobs are used to adjust the volumes of INPUT 1~6. Adjust the volume as you wish using the controls.

※ Set the controls of the unused input terminal to the minimum value.

2. TONE CONTROL

The knobs are used to adjust the BASS (100 Hz) and TREBLE (10 kHz). You can adjust the tone as you wish.

※ Carefully use the controls since the sound may get distorted and the amplifier may get damaged if the controls are set too high.

3. MAIN VOLUME CONTROL

It is a control to adjust the volume of the entire signal set by each input volume control. Turn the knob clockwise to increase the volume.

4. CHIME SWITCH

It is a switch to ring the chime of the 4-note scale. The chime indicator is turned on while the chime is ringing.

5. SPEAKER SELECTION SWITCH

You can turn on/off the signal produced through each of the 5-speaker output terminals. Or you can turn on/off the entire output signal by using the ALL switch. If a speaker output is turned on, the corresponding indicator on top of the switch will be turned on.

※ Turn off the unused selection switch(es).

6. POWER SWITCH

It turns the power of the device on and off.

When the power cord is plugged in, the device stays in standby mode. When the power switch is turned on, the device is turned on and the power indicator displays the green color.

7. POWER INDICATOR

It is an indicator to display the power status. When the power switch is on, the indicator is green.

8. PROTECTION CIRCUIT INDICATOR

It is an indicator to display the operating status of the protection circuit in the device. If the indicator is red, the amplifier output is blocked.

9. OUTPUT LEVEL INDICATOR

It is an indicator to display the level of output signal.

※ Carefully adjust the Main Volume Control not to keep the output level indicator red.

10. MODULE INPUT PORT

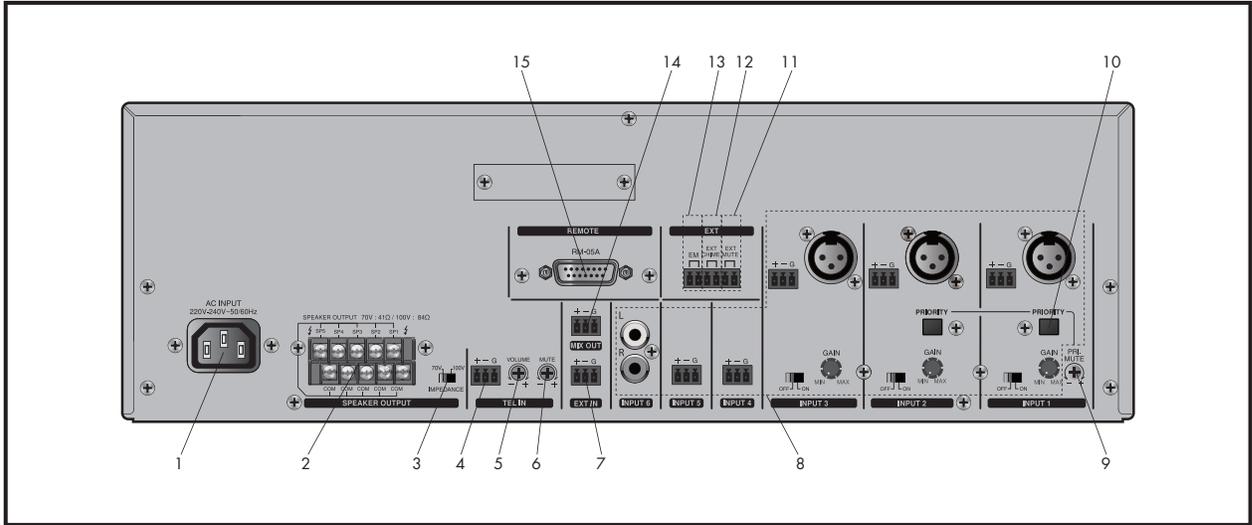
It is a slot to mount the sound source module. The modules that you can mount are as follows

- ① PAM-CDU: CD-DA, CD-MP3, USB
- ② PAM-SDU: USB, SD Card
- ③ PAM-FMT: FM Tuner
- ④ PAM-BTU: Bluetooth, USB
- ⑤ PAM-WRS91L: 900MHz Wireless Receiver
- ⑥ PAM-MPM4A: CD-DA, CD-MP3, USB, FM Tuner

The types of modules that you can mount are subject to change.

- ※ In the case of the PAM module, turn off the device before connecting the module. Remove the screws from the module slot, completely insert the module into the slot, and then fix the screws.
- ※ In the case of the FM Tuner module, mount the module in the left slot.
- ※ Keep the FM antenna as far away from the speaker or power line as possible. In the case of poor reception or noise problems, connect a 75 Ω coaxial cable to the antenna and array the cable near the outdoor area before connecting the FM antenna.

Rear Panel



1. AC POWER INPUT TERMINAL

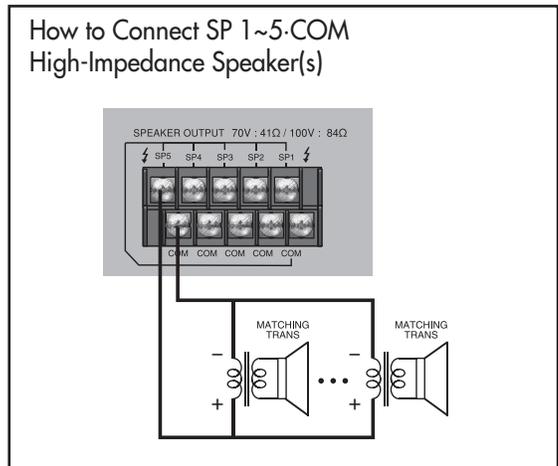
It supplies power to this device. The power used for this is PAM-312/348 : AC 120-240V, 50/60Hz, PAM-324/336 : AC 120V, 60Hz or AC 220-240V, 50/60Hz. Do not bend, pull, twist, heat, or cut the power cord excessively. It may damage the cord and cause a fire or electric shock.

2. SPEAKER OUTPUT TERMINAL

It is a terminal to connect with the speaker(s).

- ※ After connecting with the speaker(s), carefully keep them from being overloaded when you use them.
- ※ You can control the SP 1~5 terminals by using the speaker selection switches in front or the CH 1, 2, 3, 4, and 5 buttons of the RM-05A.
- ※ Before connecting with the speaker(s), unplug the power cord. Then, connect the speaker(s) to use with the speaker terminal(s) in the rear panel according to the following methods.
- ※ Caution: When installing the system, make sure that the total impedance of the speaker(s) does not fall below the regulated impedance under all circumstances. Impedance and low output voltage are listed below.

Model	SP1~5/COM Terminal	
PAM-312	100V/84Ω	70V/41Ω
PAM-324	100V/42Ω	70V/21Ω
PAM-336	100V/27.7Ω	70V/13.6Ω
PAM-348	100V/20.8Ω	70V/10.2Ω



3. IMPEDANCE SELECTION SWITCH

It is a switch to select the impedance before connecting with the speaker(s). Select 70V or 100V impedance as desired.

4. TEL IN TERMINAL

It is a terminal to connect and use a unit such as TP-6231A, Private Branch Exchange (PBX), or Paging Adaptor. You can broadcast through the transmitter of the telephone.

A balanced audio signal is input (signal +, signal-, GND).

※ You cannot connect the telephone line directly.

※ If a signal is input into the TEL IN terminal, all the input signal volumes other than the EM signal are turned down according to the values set by the TEL IN Priority Adjustment Volume and the INPUT 1 and 2 Priority Adjustment Volume.

5. TEL IN INPUT SENSITIVITY CONTROL

It is a control to adjust the TEL IN input sensitivity. If you set the control to minimum, the input sensitivity is set to 0 dBV (1 Vrms); if you set the control to maximum, the input sensitivity is set to -20 dBV (100 mVrms).

6. TEL IN PRIORITY ADJUSTMENT VOLUME (TEL IN MUTE)

It adjusts how much the INPUT 1, INPUT 2, and CHIME sounds are decreased when a signal is input into the TEL IN terminal. You can adjust how much the INPUT 3 ~ INPUT 6, EXT IN, and module sounds are decreased by using the INPUT 1 and 2 Priority Adjustment Volume next to INPUT 1.

If a signal is input into the TEL IN terminal, all the signal volumes other than the EM signal are turned down according to the values set by the TEL IN Priority Adjustment Volume and INPUT 1 and 2 Priority Adjustment Volume.

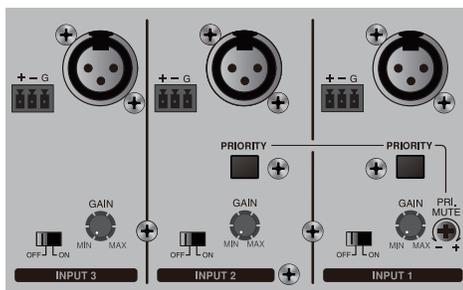
7. EXTERNAL INPUT (EXT IN) TERMINAL

It is a terminal to connect with the output terminal of the external device. A balanced audio signal is input (signal +, signal-, GND). The input sensitivity is 0dBV (1Vrms).

8. INPUT 1~6 TERMINALS

They are INPUT 1~6 terminals. A balanced audio signal is input for the INPUT 1~5 terminals (signal +, signal-, GND). The INPUT 6 is an RCA terminal to input an unbalanced audio signal (signal, GND).

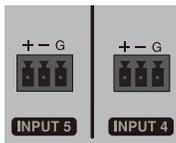
1) INPUT 1~3 Terminals



(1) PHANTOM Switch: If you want to use a condenser microphone, turn this switch on to provide DC 24V PHANTOM power.

- (2) INPUT GAIN Volume: It adjusts the input sensitivity. If you set the volume to minimum, a signal of - 20 dBV (100 mVrms) can be input; if you set the volume to maximum, a signal of -60 dBV (1 mVrms) can be input.
- ※ Since the XLR jack and the Euro terminal in INPUT 1~3 are internally connected, do not use them at the same time.
 - ※ Before turning the PHANTOM switch on or off, set the volume of corresponding channel to minimum. Otherwise, a large amount of noise will be output when turning the switch on/off.
 - ※ If not using a condenser microphone, make sure to turn the PHANTOM switch off. If you turn on the PHANTOM switch when the source device is connected, be careful else the device may break down.

2) INPUT 4~5 Terminal



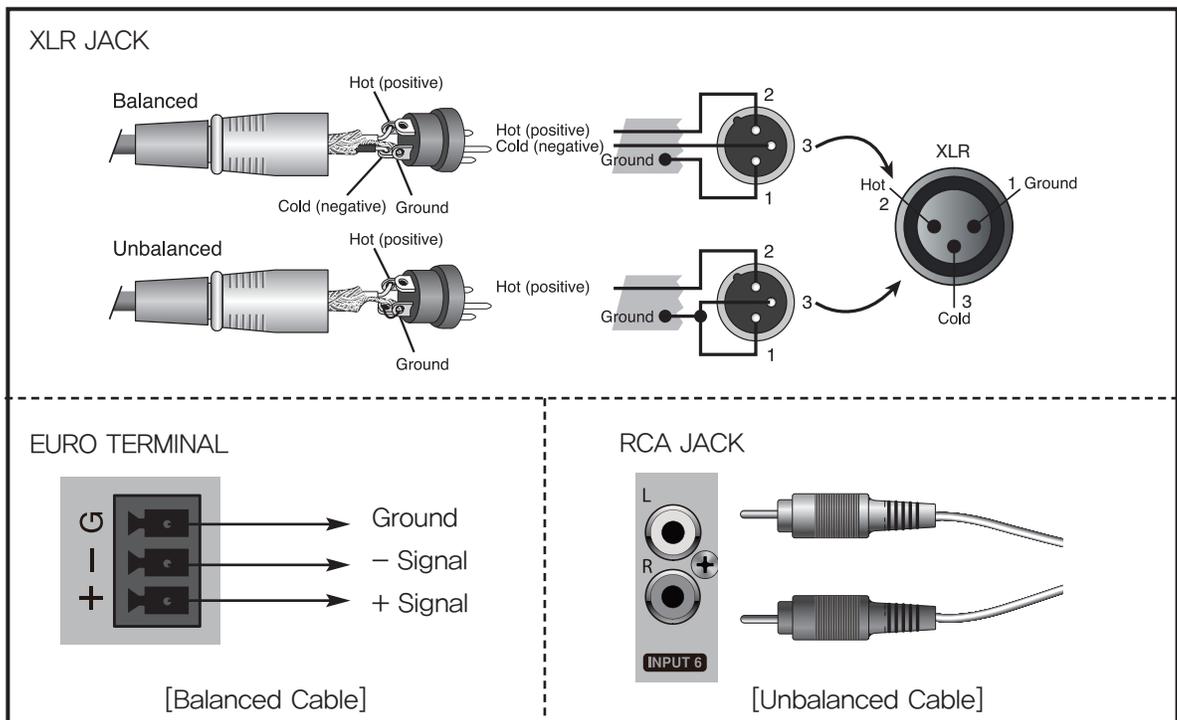
You can use the terminals for LINE input. A balanced signal (signal+, signal-, GND) with -20dBV (100mVrms) sensitivity is input.

3) INPUT 6 Terminal



Connect to an audio source device with STEREO output. An unbalanced signal (signal, GND) with -20 dBV (100mVrms) sensitivity is input.

- ※ For methods of connecting the XLR jack, Euro terminal, and RCA jack, refer to the following.
- ※ If you use an unbalanced cable, turn the PHANTOM switch off.



9. PRIORITY ADJUSTMENT VOLUME (PRIORITY MUTE)

It adjusts how much the volume of the INPUT 3~6, EXT IN, and PAM module decreases if your device is operated under the following conditions.

If you minimize the volume, the volume size to decrease is set to maximum; if you maximize the volume, the volume size to decrease is set to minimum.

- 1) If a signal is input into INPUT 1 and 2, the RM-05A or the CHIME is operated
- 2) If an external MUTE switch terminal is operated
- 3) If a signal is input into the TEL IN terminal

※ INPUT 1 and 2, RM-05A, and CHIME signals are output prior to the INPUT 3~6, EXT IN, and PAM module signal.

10. PRIORITY SELECTION SWITCH

It is a switch to turn on/off the priority operation of INPUT 1 and INPUT 2. The corresponding channel will perform the priority operation only when the switch is turned on. The priority is as follows
EM > TEL IN > INPUT 1/RM-05A, INPUT 2, CHIME > INPUT 3/4/5/6, EXT IN, PAM Module

11. EXTERNAL MUTE SWITCH TERMINAL

It is a terminal to connect with the switch to mute the sound of the INPUT 1~6, RM-05A, CHIME, and EXT IN, module externally in the device. When contact closure is input into the external MUTE switch terminal, the sound volumes of the INPUT 1~6, RM-05A, CHIME, EXT IN, and PAM module are turned down according to the values adjusted by the TEL IN Priority Adjustment Volume and the INPUT 1 and 2 Priority Adjustment Volume.

12. EXTERNAL CHIME (EXT CHIME) SWITCH TERMINAL

It is a terminal to connect with the switch to operate the 4-note scale chime in the device externally. When contact closure is input into the external chime (EXT CHIME) switch terminal, the 4-note scale chime is operated.

For the EXT CHIME switch, use a momentary switch by which the On/Off status is not fixed.

13. EXTERNAL EM (EXT EM) SWITCH TERMINAL

It is a terminal to connect with the contact closure for emergency broadcasting. When the corresponding contact closure is input, the internally saved emergency broadcasting message is output. At this time, you cannot adjust the output volume produced by the Main Volume Control.

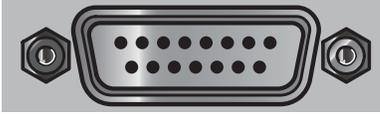
Even if the Power Switch in front is turned off, the device is automatically turned on when the EM contact closure is input. And then, the emergency message is output through the entire speaker zones without considering the status of speaker selection switches in front. In this case, the device will be automatically turned off and will return to the original mode when the EM contact closure is off.

14. MIX OUTPUT (MIX OUT) TERMINAL

It is an output terminal to record the sound output from the device or to connect with other amplifier(s) used in parallel. You cannot adjust the signal output volume with the Main Volume Control. A balanced audio signal is output (signal +, signal -, GND).

15. RM-05A CONNECTION TERMINAL

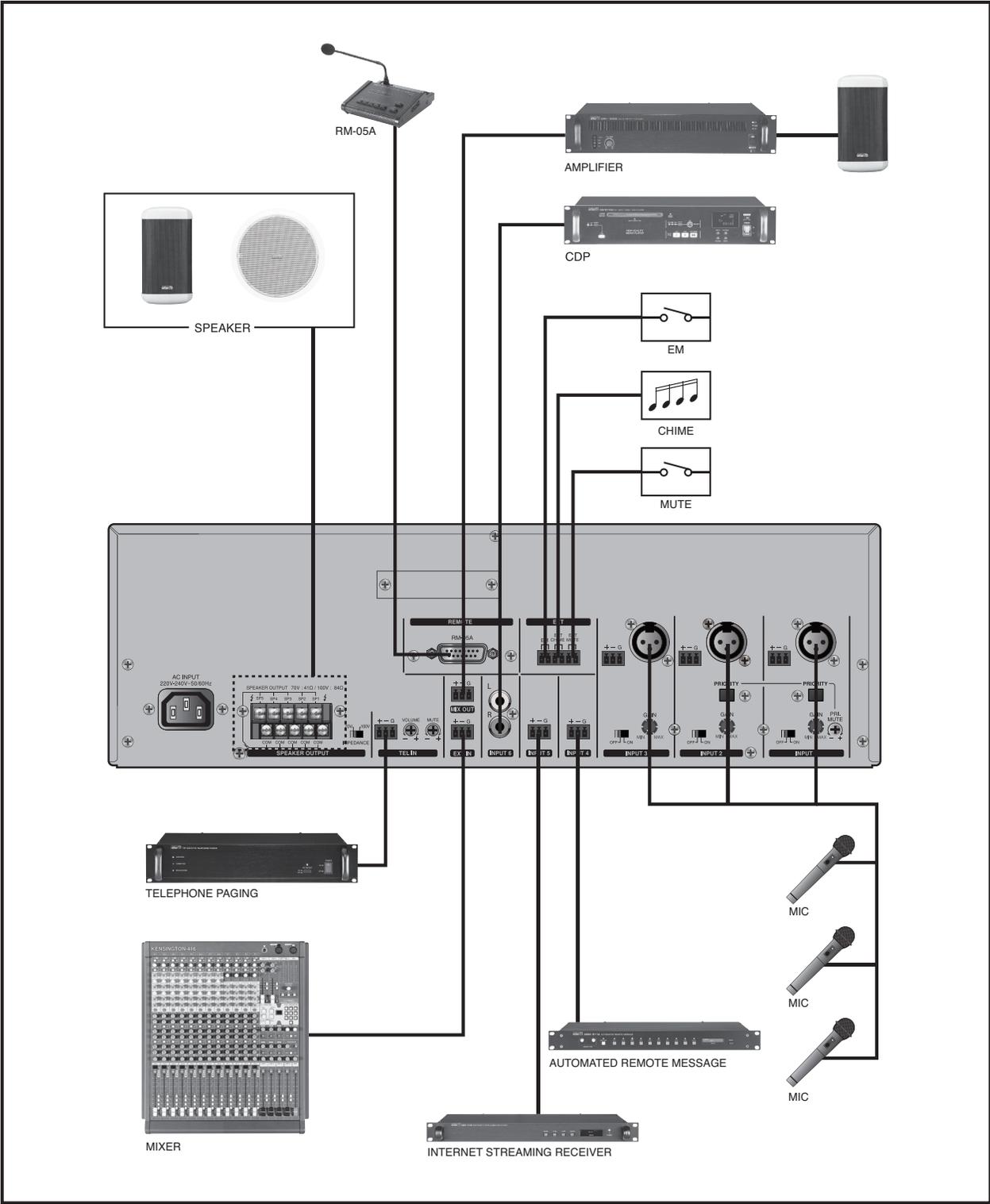
It is a terminal to connect with our RM-05A. The pins of the terminal are arrayed as follows.



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

- ※ If using the RM-05A, adjust the output volume with the INPUT 1 channel volume in the front panel.
- ※ Make sure to power off the device before connecting or disconnecting the RM-05A.

Applications



How to Mount the PAM Module

- (1) Turn off the device before connecting the PAM module.
- (2) Remove the screws from the module slot in front and open it.
- (3) Insert the module to mount completely into the slot.
- (4) Fix the 4 edges of the module with screws.
- (5) Turn on the device.
- (6) Check whether the status data of the module is displayed in the installed PAM module indicator.
- (7) If power is not supplied to the installed PAM module, turn off the device, remove the module from the slot, mount it again, and fix it carefully with screws.
- (8) Turn on the device again and check whether the module is turned on.
- (9) Adjust the output volume by using the volume control in the module.
- (10) Adjust the Main Volume Control in the device to check the output sound from the module through the speaker(s).

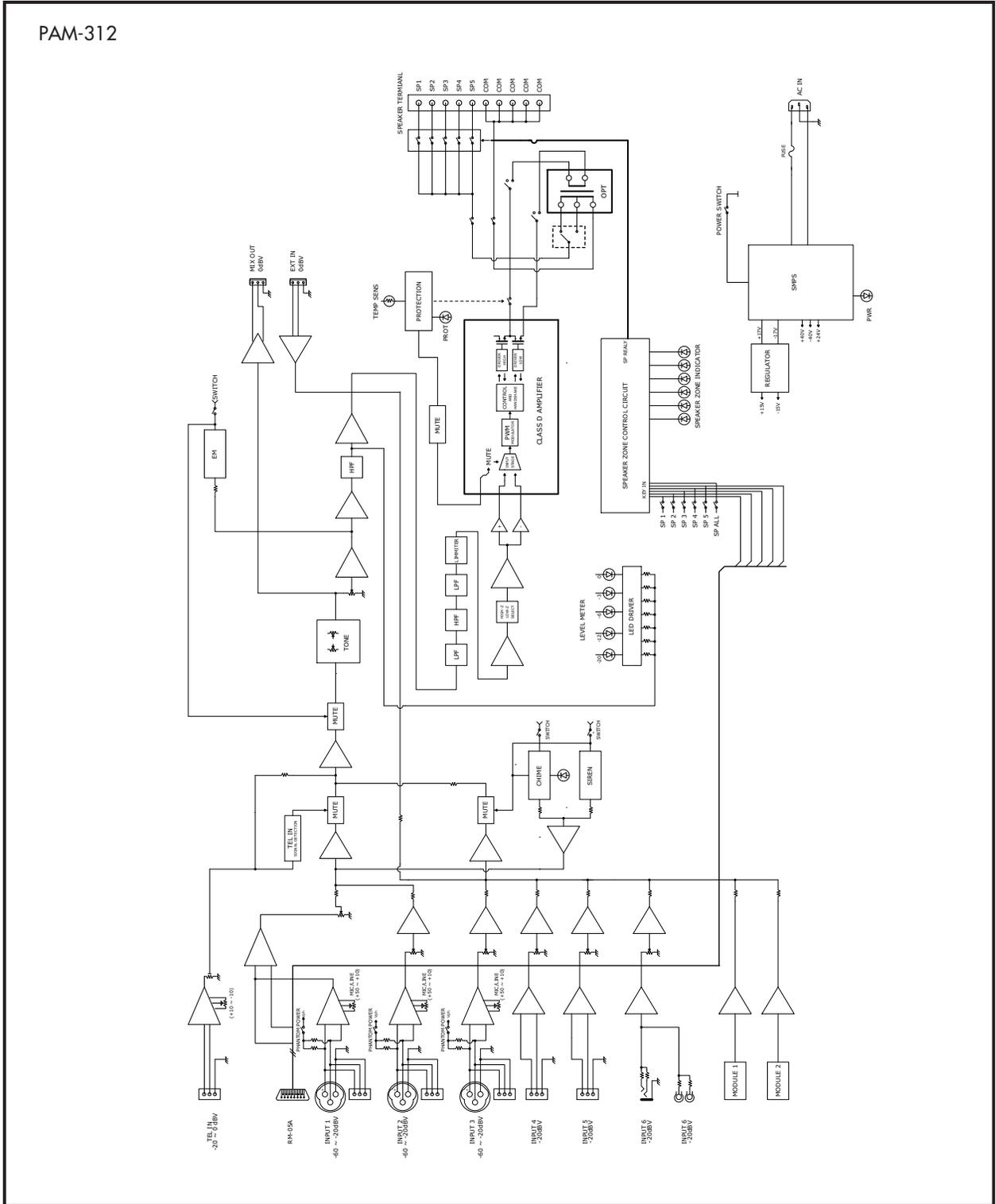
Precautions to Mount the FM Tuner Module

- (1) If you install an FM Tuner module, mount it in the left module slot.
- (2) Install the FM antenna as far away from the speaker cable or power cable as possible.
- (3) If FM reception is poor or there are too many noise problems, connect a 75 Ω coaxial cable with the module antenna and array the cable near the outdoor area before connecting the antenna to the end of the cable.

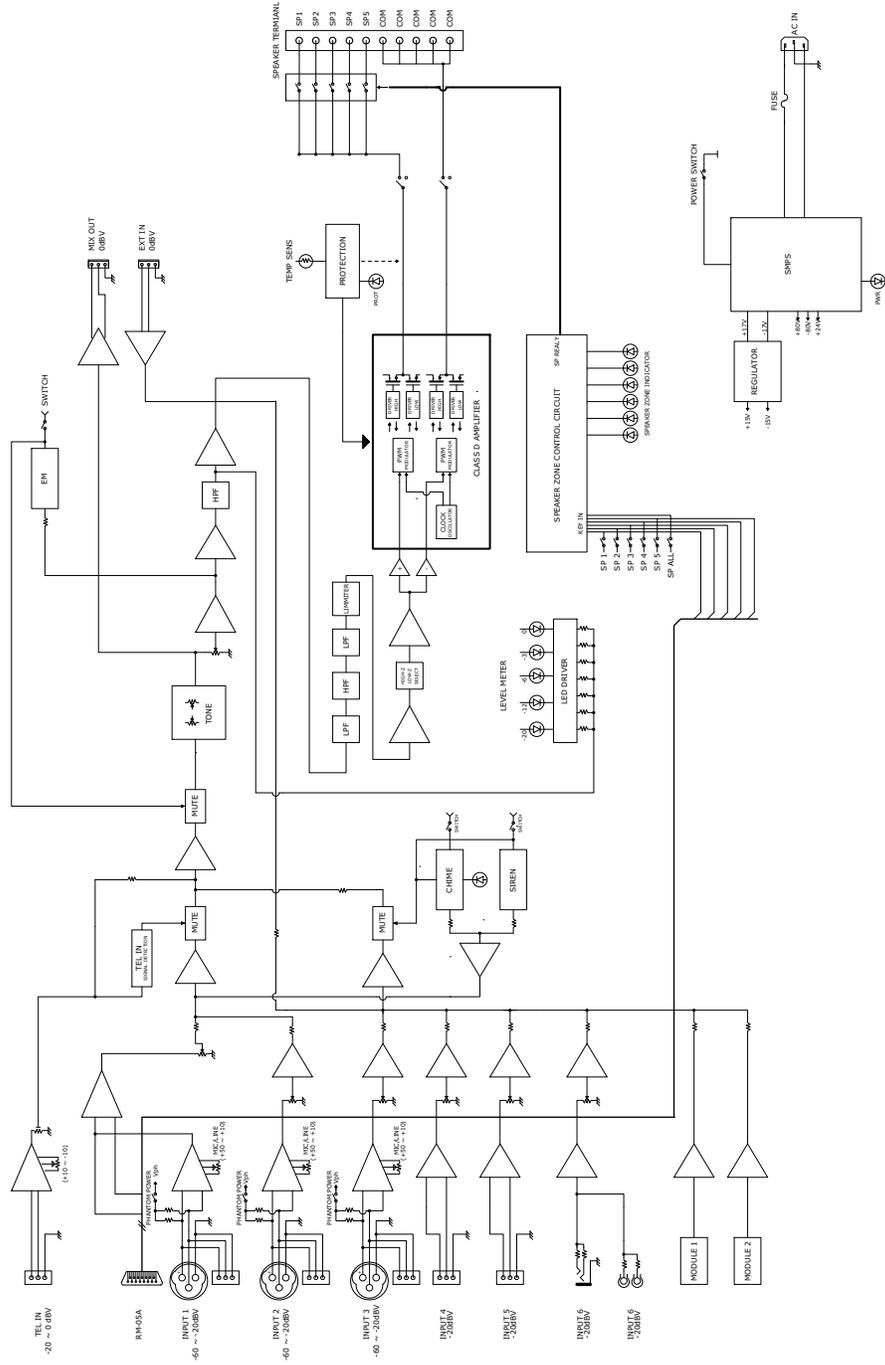
Troubleshooting

Symptom	Solution
Audio is not output	<ol style="list-style-type: none"> 1) Check whether power is supplied to the device. 2) Check whether the volume of the connected input channel is locked. 3) Check whether the speaker output switch is turned off. 4) Check whether the external MUTE contact closure is connected.
Audio is intermittently disconnected	<ol style="list-style-type: none"> 1) Check whether the Output Level Indicator is red. Volume-down the Main Volume Control. 2) Check whether the impedance of connected speaker is lower than the regulated impedance.
The audio signal is distorted	<ol style="list-style-type: none"> 1) Check whether the channel volume and the Main Volume are adjusted high. 2) Check whether the BASS and TREBLE volume are adjusted high.
PRIORITY MUTE is not operated	<ol style="list-style-type: none"> 1) Check whether the PRIORITY switches of INPUT 1 and INPUT 2 are turned off.
The RM-05A microphone does not output any sound	<ol style="list-style-type: none"> 1) Check whether the RM-05A CH 1~5 button is pressed. 2) Check whether the channel volume of INPUT 1 is set to the minimum value and locked.

Block Diagram



PAM-324/336

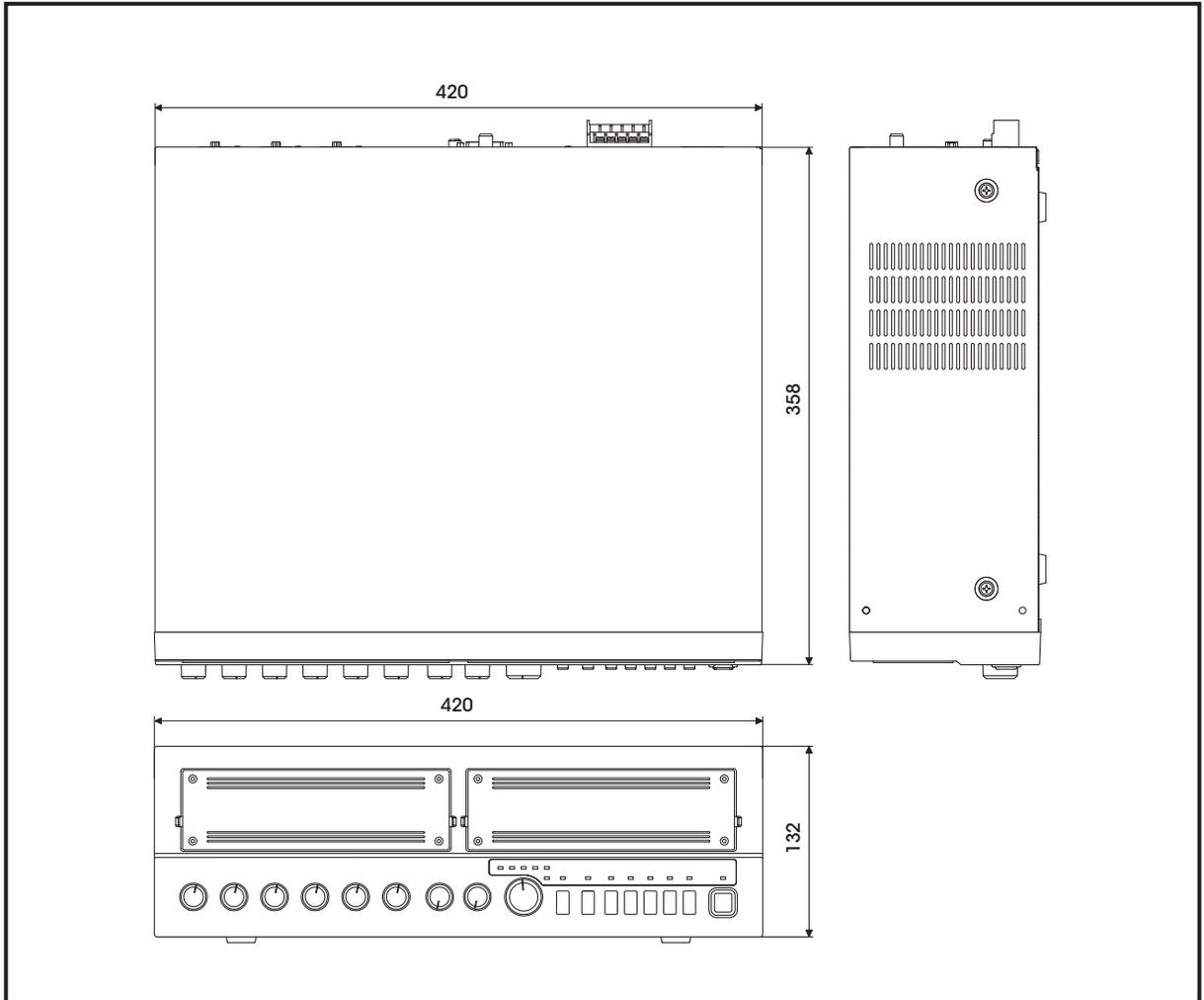


Specifications

		PAM-312	PAM-324	PAM-336	PAM-348
Rated Output Power (1kHz, THD 1%)	70V/100V	120W	240W	360W	480W
Frequency Response (1W, ±3dB, 20kHz LPF)	LINE	80Hz~15kHz			
	MIC	100Hz~15kHz			
THD (Rated Power, 1kHz)		Less than 1%			
S/N, A-WTD	LINE	Better than 70dB			
	MIC	Better than 55dB			
Input Sensitivity / Impedance					
Input 1~3 / Input Impedance	MIC	-60dBV/2kΩ (Balanced)			
	LINE	-20dBV/2kΩ (Balanced)			
Input 4~5 / Input Impedance	LINE	-20dBV/30kΩ (Balanced)			
Input 6 / Input Impedance	LINE	-20dBV/20kΩ (Un-Balanced)			
TEL IN / Input Impedance		-20dBV~0dBV/40kΩ (Balanced)			
EXT IN / Input Impedance		0dBV/40kΩ (Balanced)			
MIX OUT		0dBV (Balanced)			
Speaker Output Level/Impedance		100V/84Ω	100V/42Ω	100V/27.7Ω	100V/20.8Ω
		70V/41Ω	70V/21Ω	70V/13.6Ω	70V/10.2Ω
TONE CONTROL	BASS(100Hz)	±10dB			
	TREBLE(10KHz)				
Operating Temperature		-10°C ~ +40°C			
Power Source		AC 120-240V, 50/60Hz	AC 120V, 60Hz or AC 220-240V, 50/60Hz		AC 120-240V, 50/60Hz
Power Consumption (1/8W output)		60W	95W	95W	135W
Weight (Set)		7.26kg/16lb	6.93kg/15.3lb	6.93kg/15.3lb	7.16kg/15.8lb
Dimensions (Set)		420(W) x 132(H) x 358(D)mm/16.5(W) x 5.2(H) x 14(D)in			

* 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.



Inter-M, Ltd. (Korea) began operations in 1983.

Since then, Inter-M has grown to become one of the largest manufacturers of professional audio and commercial sound electronics equipment in the world.

Inter-M has gained worldwide recognition for its own branded products, as well as private label manufacturing of electronics sold under other names (OEM).

The company is no longer just a Korean company, but rather a global company that is truly international in scope, with factories and offices in Korea and China, and sales and marketing operations located in Japan, Europe, and the U.S.A.

With more than 850 employees around the globe, Inter-M is well-poised for further growth and expansion.

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