



INSTRUCTION MANUAL

PA2120 120W 100V

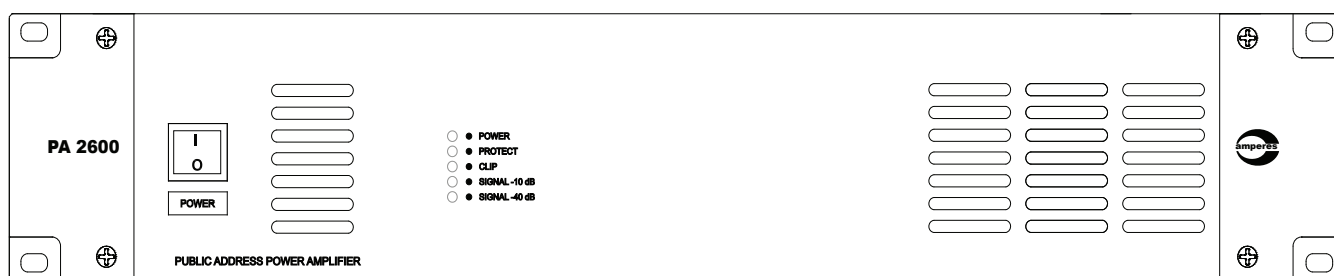
PA2240 240W 100V

PA2360 360W 100V

PA2480 480W 100V

PA2600 600W 100V

Public Address Power Amplifier



Thank you for choosing another quality product from Amperes Electronics.

The PA2000 series had been improved further, with better performance, lower power consumptions and lighter in weight as compared to its predecessor. Every model in the series is now with 2 HU heights and would definitely be a great saving to the rack spaces.

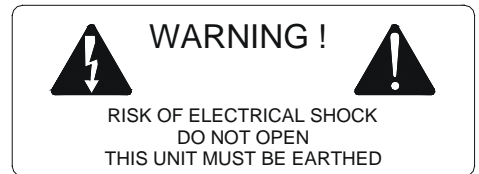
They are available in power ratings of 120 to 600W 100V line. With its enhanced power house, sound reproduction has been greatly improved. Durability and reliability index had been further elevated due to its re-engineered protection circuitries.

Installing the enhanced PA2000 series in your system would definitely a right choice, for it shall be the tough work horse for years to come.

Important Safety Instructions

The lightning flash symbol with arrowhead within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be sufficient magnitude to be a risk of electric shock to person.

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



WARNING - When using electric products, basic precautions should always be followed including the followings :

1. Read all the SAFE INSTRUCTIONS before using the product.
2. This product must be earthed. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce risk of electric shock.

This product is equipped with a cord having an equipment grounding conductor and a grounding plug.

The plug must be plugged into an appropriate outlet that is properly installed and earthed in accordance with all local codes and ordinance.

DANGER - Improper connection of the equipment-grounding connector can result in a risk of electric shock. Check with a qualified electrician or servicemen if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product, if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

3. To reduce the risk of injury, close supervision is necessary when the product is used near children.
4. Do not use this product near water, for example, near a bathtub, washbowl, kitchen sink, in a wet basement or near a swimming pool or the like.
5. This product should be located so that its location or position does not interfere with its proper ventilation.
6. This product should be located away from heat sources such as radiators, heat registers or other products that produce heat.
7. This product should be connected to a power supply only of the type described on the operating instructions or as marked on the product.
8. This product may be equipped with a polarized line plug (one blade wider than the other). This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.
9. The power supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply cord, do not pull on the cord, but grasp it by the plug.
10. Care should be taken so that object do not fall and liquid are not spilled into the enclosure through openings.
11. The product should be serviced by a qualified service personnel when :
 - a. The power supply cord or the plug has been damaged or,
 - b. Objects has fallen, or liquid has been spilled into the product, or
 - c. The product has been exposed to rain, or
 - d. The product does not appear to operate normally or exhibits a marked change in performance, or
 - e. The product has been dropped or the enclosure damaged.
12. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other serving should be referred to qualified service personnel.
13. **WARNING** - do not place objects on the products' power cord or place it in a position where alone could trip over, walk on or roll anything over it. Do not allow the product to rest on or to be installed over power cords of any type. Improper installations of this type create the possibility of fire hazard and / or personal injury.

Thank You...

We thank you for putting your trust on another products produced by Amperes Electronics. And yes, we went a long way to ensure that this unit is a reliable workhorse when it is rolled out from the production line. That includes tireless design improvements, vigorous testing and monitoring and not forgetting the long operational testing duration. All to ensure that you get the right product with minimal investment ... something worth the money spent.

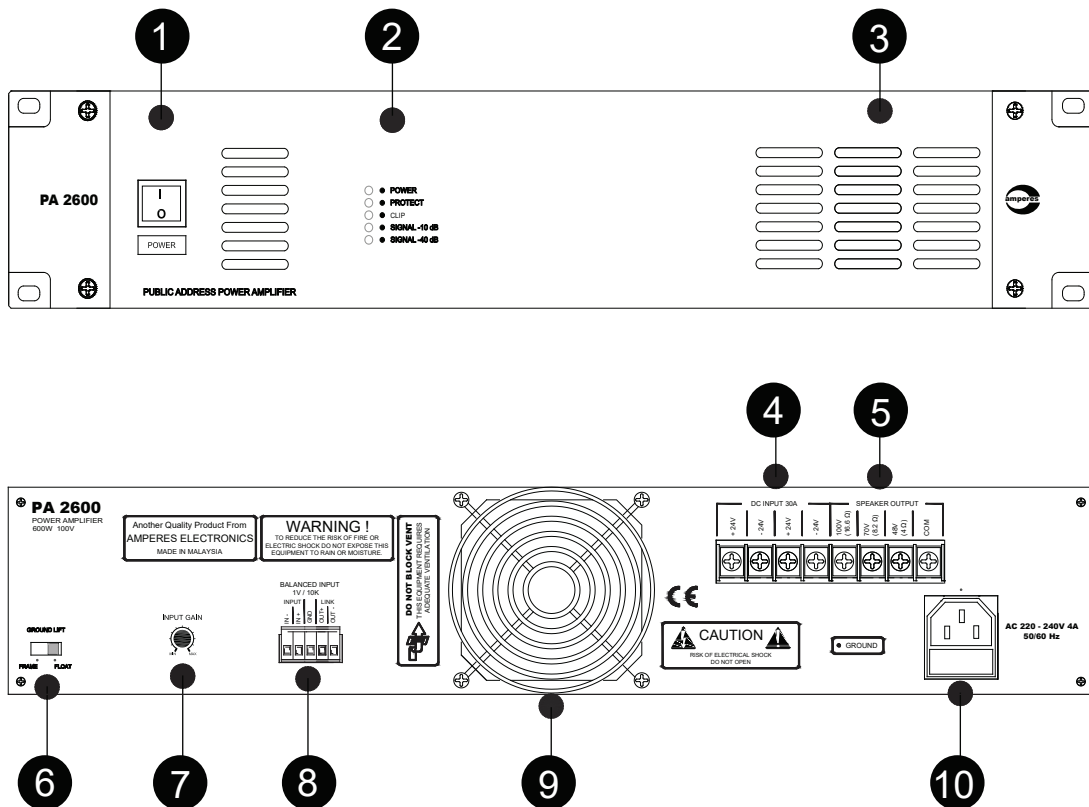
Although these models of amplifiers look similar to any other conventional types available in market, we appreciate if you would spend some time reading through the manual to ensure the unit is properly installed in accordance to our recommendations. We believe that this habit shall ensure that the unit works perfectly beyond your expectations in years to come.

Please keep this manual for future reference.

Summary Of Features

Thermal Protection	Ensures the amplifier do not operate under thermal run-away state, which do not only distort the sound reproduction but could damage the components. Upon reaching a preset temperature, the amplifier would enter protect mode which would let the unit idle until the excessive heat is dissipated.
Short Circuit Protections	The amplifier shall enter into protection mode shall the speaker line is short circuit, which may cause overheating too. Please check the speaker line whenever the protection LED is on and remove any shorted cable as soon as possible. Permanent short circuit may cause permanent failure to the amplifier.
Dual Speed Cooling Fan	Heat dissipates by external air forced into the heat sink. Under extreme condition, the system shall detect the heat produced and if it exceeds the capacity of normal cooling system, the fan shall increase its speed automatically to ensure the amplifiers keep operating under optimum temperature.
Balanced Input With Gain Control	Input is via balanced signal and the gain control is available at the rear panel of the unit, which avoid unnecessary tampering of the volume by unauthorized personnel.
AC / DC Operation	The amplifiers operates using mains ac supply as well as 24V DC back up supply. This ensures continuous operation of your system whenever mains supply is interrupted or unavailable.

Parts Identification



1. MAINS SWITCH

For switching mains ac supply and the corresponding LED shall lit accordingly. Mains LED shall not lit if the back up DC supply is available.

2. INDICATION LEDS

Mains LED for incoming mains supply and Protect LED is to indicate if the unit is switched to protection mode. Clip LED shall lit if the incoming signal is too high whereas others to indicate signal level in two level ie. -40 dB and -10 dB.

3. FRONT VENT

External cool air enters the unit from these vent holes. Please ensure that there is sufficient clearance for ventilation.

4. DC SUPPLY

For connection of back up 24V DC supply from batteries. Two ports are available for parallel connections.

5. SPEAKER OUTPUT

Outgoing terminals to speakers are available in 4 Ohm, 70 and 100V line for usage with transformer coupled speakers. The total speakers combined should have impedance higher than stated in the corresponding output terminals to avoid overloading.

Loudspeakers with suitable matching transformer can be connected to the 70 or 100V line outputs in parallel. However the total load should not exceed the nominal power output rating of the amplifier.

Do not parallel two power amplifiers in order to gain higher power rating as this may cause overloading in the event that any one of them failed.

Parts Identification

6. GROUND LIFT SWITCH

The sliding switch allows separation of body earthing from signal common to prevent hums noise.

7. VOLUME KNOB

Output volume is adjustable from -15dB to 0 dB.

8. INPUT CONNECTOR

Audio output from pre-amplifier mixer is connected to this port at "Input" terminals before link it to the next amplifier thru link terminal. Signal ground shall be joint together as they are common. Please refer to the chapter " Unit Installation " page 6.

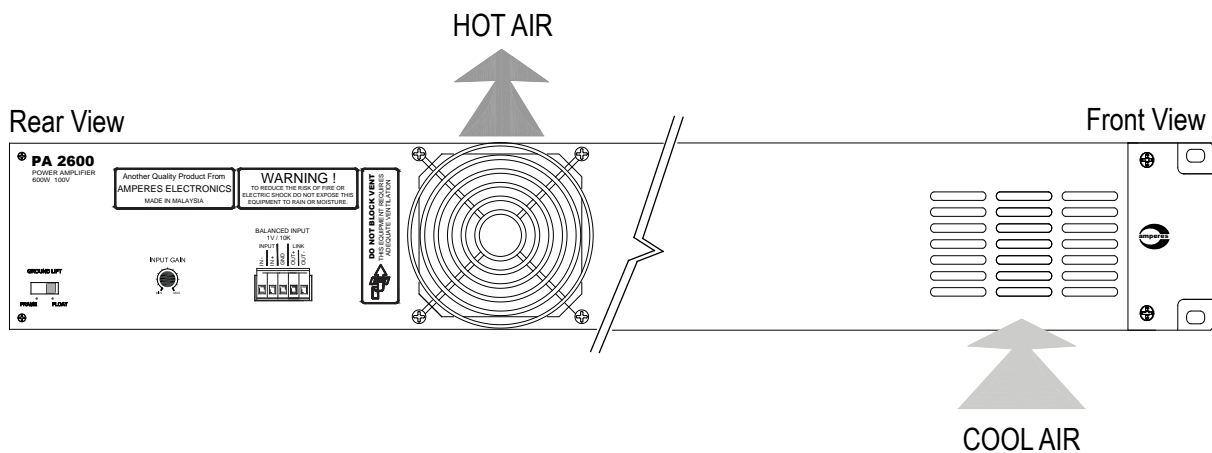
9. VENT FAN

The vent fan draws internally generated hot air and dispersed by the fan. The fan has dual speed which is determined by the internal heat sink temperature. To allow proper cooling, please ensure that the ambient is properly ventilated.

10. MAINS AC CORD

Mains AC cord comes with standard British 3 pin plug with fuse. Please refer to the table at page 10 for suitable fuse replacement.

Unit Installation



The above diagram depicts the air flow pattern for the amplifier cooling system. Cool air intake is taken from outside via dual speed temperature dependent fan. Several outlets of the warm air dissipations can be found in front panel, sides as well as top cover.

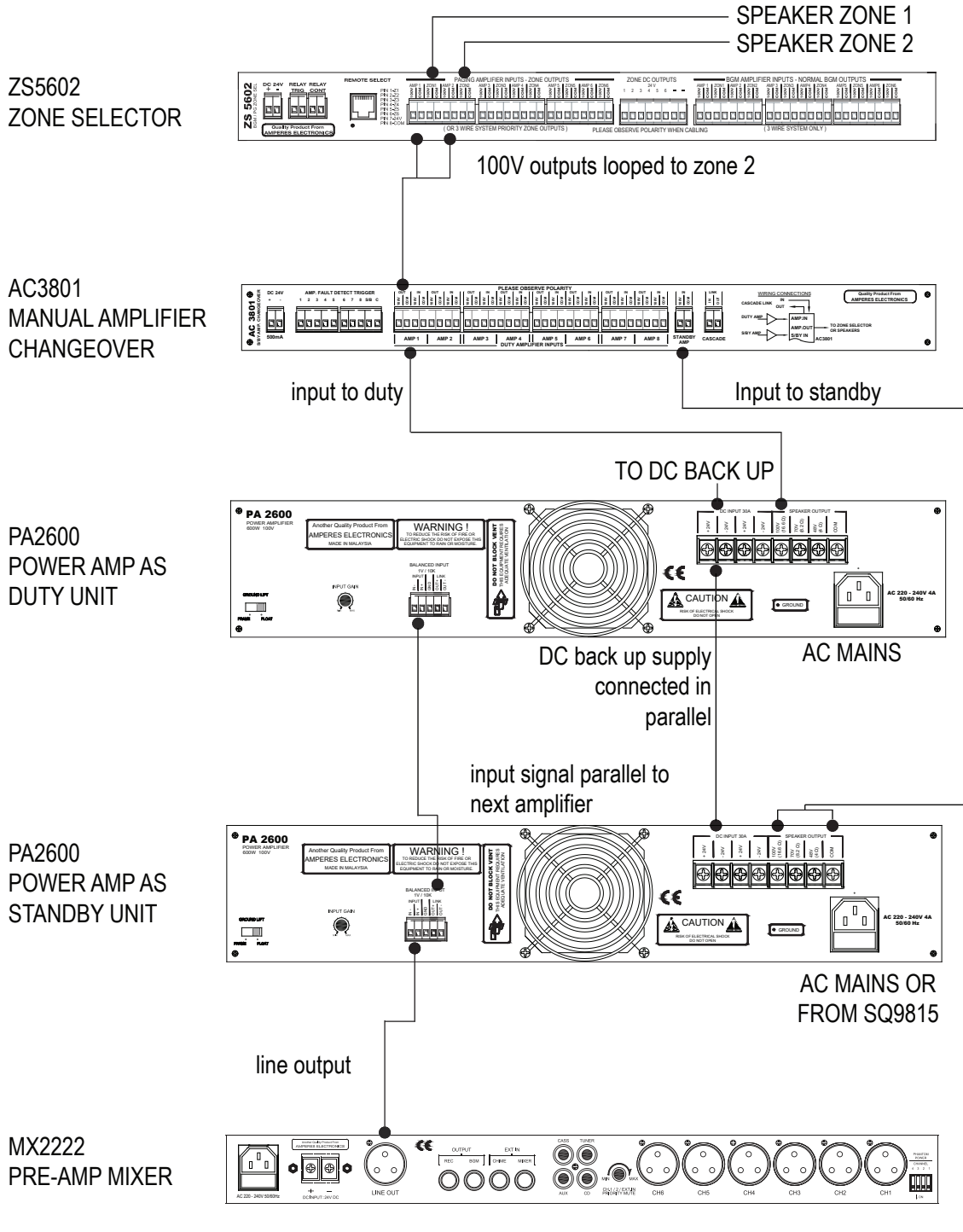
Please ensure these vent holes are not blocked in order to keep the operating temperature at optimum. Allow a breathing space of 100 mm for each vent outlet.

For installation in rack, we recommend that internal rack ventilation fans are installed, one for cool air intake and the other for heat dissipation.

The optimum operating temperature of the unit shall be kept at approximately 40 degree Celsius. The fan shall rotate at high speed upon reaching the temperature of 45° at the transistor module.

Unit Installation

Application example using one duty amplifier with one standby unit connecting to two zones of speakers.



Unit Installation

Application with Amperes AX3800 as auto amplifier changeover unit. 24V DC power supply connections and incoming 240V ac mains not shown.

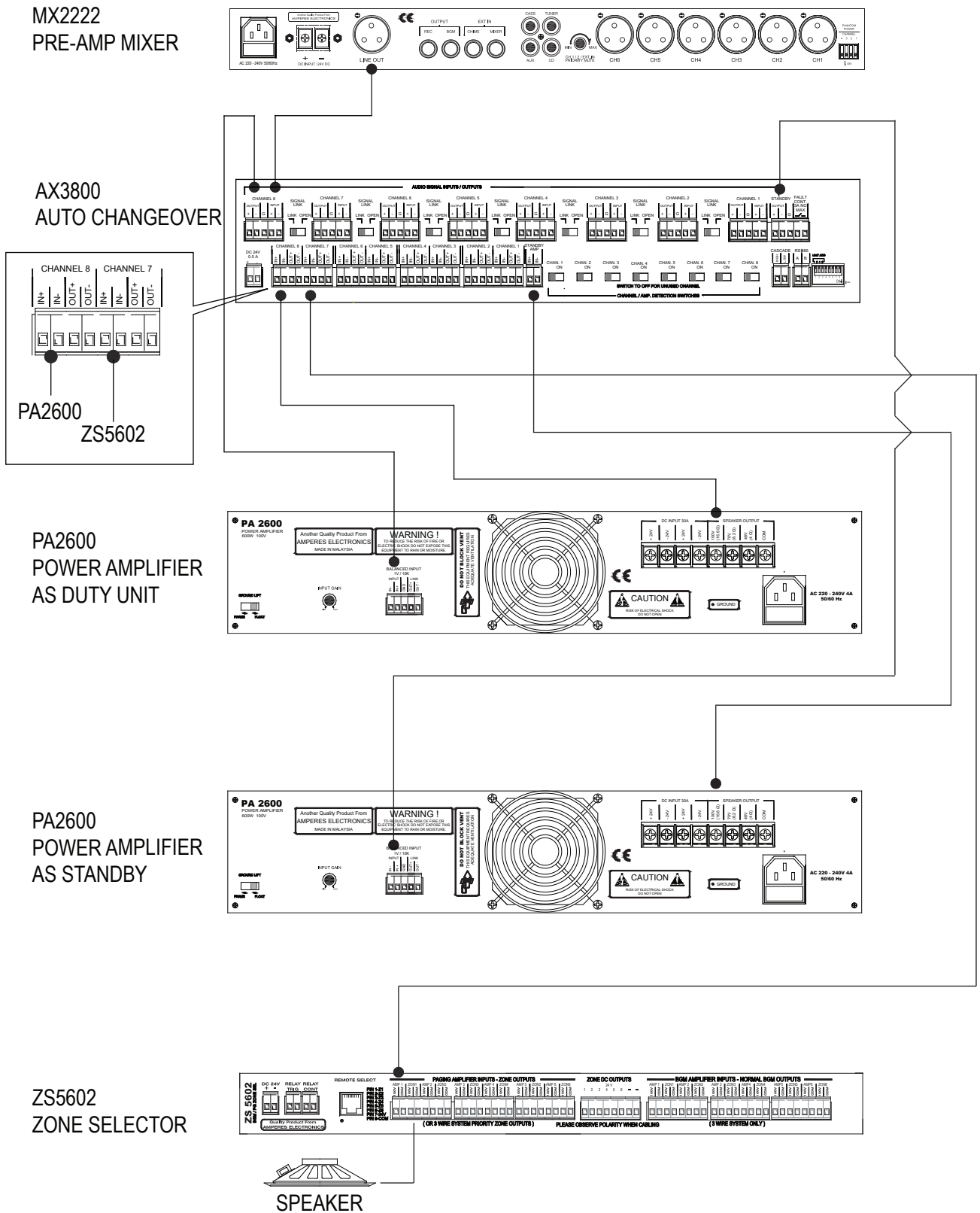
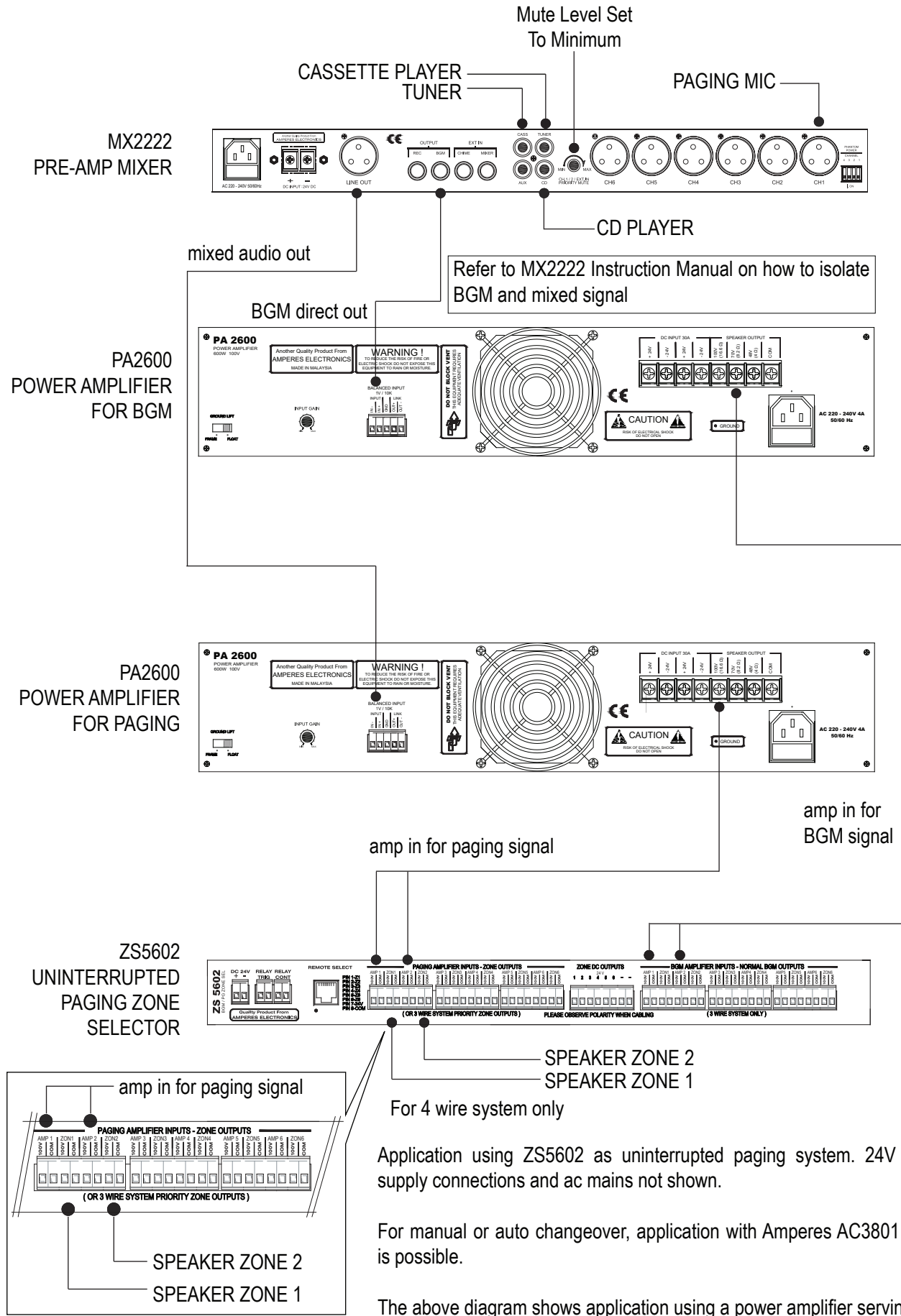


illustration shows an application with an amplifier serving two zones of speakers

System Connections - Uninterrupted Paging System

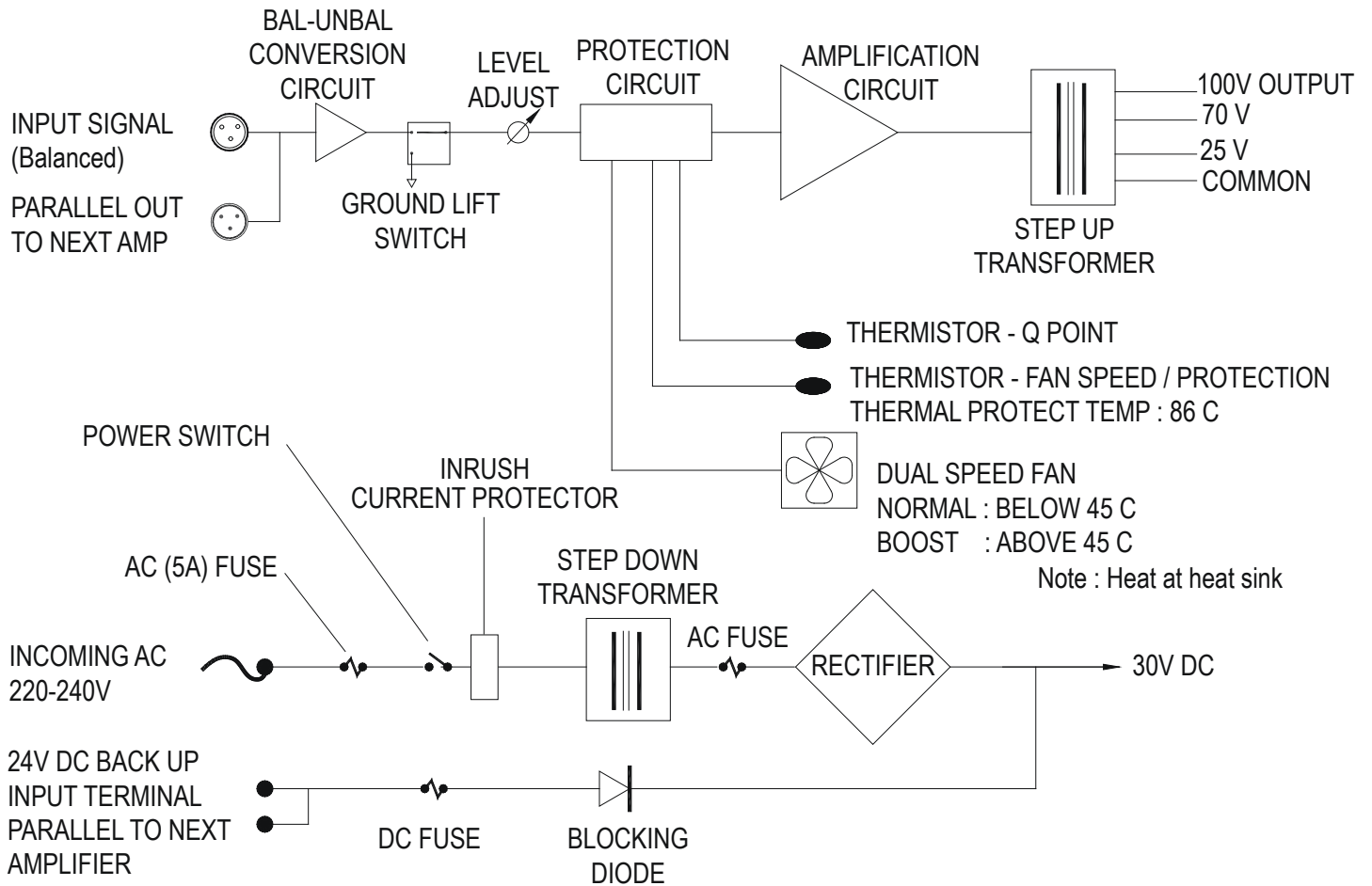


Application using ZS5602 as uninterrupted paging system. 24V DC power supply connections and ac mains not shown.

For manual or auto changeover, application with Amperes AC3801 or AX3800 is possible.

The above diagram shows application using a power amplifier serving 2 zones.

Block Diagram



The above block diagram illustrates the general block construction of the power amplifier. Detailed circuit can be obtained from our service department.

Notes

- Earth Loop** To avoid hum or noise to the output, the chassis earth and the electrical earth should be separated. this can be done by switching the Ground Lift Switch. Refer Page 5.
- Speaker Connections** Total speakers connected to the terminals should not exceed the rating specified. Connecting speakers to 100V line shall have load equivalent to the sum of all the rating of the speakers. Connecting the same loudspeakers to the 70V line shall only consume half of the power, thereby, twice the number of speakers of the said rating can be connected to 70V line terminal.
- Speaker Polarity** Speakers with '+' terminal should be connected to 100V line output. Distortion sound clarity can occur when anti phase connections are made and is apparent when they are installed closed to each other.

Technical Specifications

	PA2120	PA2240	PA2360	PA2480	PA2600
Operating voltage	220 - 240V AC or 24V DC back up supply				
Power consumption (240V AC)	255VA (1.0A)	497VA (1.9A)	731VA (2.8A)	996VA (3.8A)	1069VA (4.1A)
Current consumption (24V DC)	6.1A	10.6A	16.3A	22.3A	23.1A
Standby current (24V DC)	0.2A		0.3A	0.4A	
Input signal	1V / 10K Ohm; balanced via XLR female				
Input gain controls	-40 to 4 dBu				
Outputs	70 / 100V line and 4 Ohm				
Rated output (100V, RMS)	120W	240W	360W	480W	600W
4 Ohm output voltage	22V	31V	38V	43.8V	48V
Output impedance (max load)	83 Ohm	42 Ohm	27 Ohm	20 Ohm	16.6 Ohm
Frequency response	70Hz - 15 KHz @ 1KHz +/-3 dB				
S/N ratio	>70 dB @ 1 KHz, 1V				
THD + N	<0.18 %				
Protections	Thermal, Short circuit, Overload, Fuse, In rush current				
Cut off temperature	75 Deg C				
Cooling system	Auto temperature controlled fan speed				
Indications	LED : Power, Signal level				
Dimensions (W x H x D)	482 x 88 x 335 mm				
Net Weight	11.40 kg	12.35 kg	16.20 kg	17.95 kg	19.60 kg

Due to our continuous product improvement policy, we reserve the rights to change the above specifications, features and artwork without prior notice.

While every care was taken to ensure the data produced in this manual is correct at time of printing, we apologize if there were to be any error that may have been unintentionally presented or omitted.

Recommended AC Fuse Rating Replacement

We recommend that slow fuses to be replaced with the following ratings to avoid premature fuse disconnection as well as to protect the internal circuitry slow blow fuses are preferred.

PA2120	PA2240	PA2360	PA2480	PA2600
4A	5A	6.3A		

Warranty Conditions

Only Amperes Electronics Service Centres are allowed to make warranty repairs : a list of Amperes Electronics Service Centres may be asked for by the purchaser or send directly to Amperes Electronics Sdn Bhd at 70 Jalan Industri PBP 3, Tmn Perindustrian Pusat Bandar Puchong, 47100, Puchong, Selangor, Malaysia or its authorized dealers. This warranty is not valid if repairs are performed by unauthorized personnel or service centres.

This warranty covers only repairs and replacement of defective parts ; cost and risks of transportation as well as removal and installation of the product from the main system are for the account of the purchaser. This warranty shall not extend to the replacement of the unit.

This warranty does not cover damages caused by misuse, neglect, accident of the product as well as using the product with power supply voltage other than shown on the product, or any other power supply source / adaptor not recommended by the manufacturer.

This warranty does not cover damages caused by fire, earthquakes, floods, lightning and every cause not directly related to the unit.

This warranty does not include any indemnity in favor of the purchaser or the dealer for the period out of use of the unit; moreover the warranty does not cover any damages which may be caused to people and things when using the product.

This warranty certificate is valid only for the described product, and is not valid if modifications are made on this certificate or on the identification label applied on the product.

This warranty covers all the material and manufacturing defects and is valid for a period of 36 months from the date of purchase or for a specified period in countries where this is stated by a national law. In this case, the extension is valid only in the country where the product is purchased.

Amperes Electronics Sdn Bhd is not obliged to modify previously manufactured products under warranty if the design changes or improvements are made.

Disclaimer

Information contained in this manual is subject to change without prior notice and does not represent a commitment on the part of the vendor. AMPERES ELECTRONICS SDN BHD shall not be liable for any loss or damages whatsoever arising from the use of information or any error contained in this manual.

It is recommended that all services and repairs on this product be carried out by AMPERES ELECTRONICS SDN BHD or its authorized service agents.

AMPERES series must only be used for the purpose they were intended by the manufacturer and in conjunction with this operating manual.

AMPERES ELECTRONICS SDN BHD cannot accept any liability whatsoever for any loss or damages caused by service, maintenance or repair by unauthorized personnel, or by use other than that intended by the manufacturer.

It is understood that the purchaser accepted and had read through the above terms and conditions of warranty and disclaimer upon unpacking and tested the product.





PA 2120 / 2240 / 2360 / 2480 / 2600 100V

PUBLIC ADDRESS POWER AMPLIFIERS

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