

INSTRUCTION MANUAL

PUBLIC ADDRESS POWER AMPLIFIER

PX SERIES with built in Auto Fault Sensor

PX2100 - 120 Watts

PX2200 - 240 Watts

PX2300 - 360 Watts

PX2400 - 480 Watts



amperes ... the emerging preference

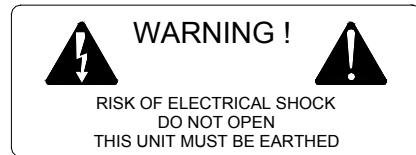
by - amperes electronics - www.ampereselectronics.com sdn bhd



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



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.

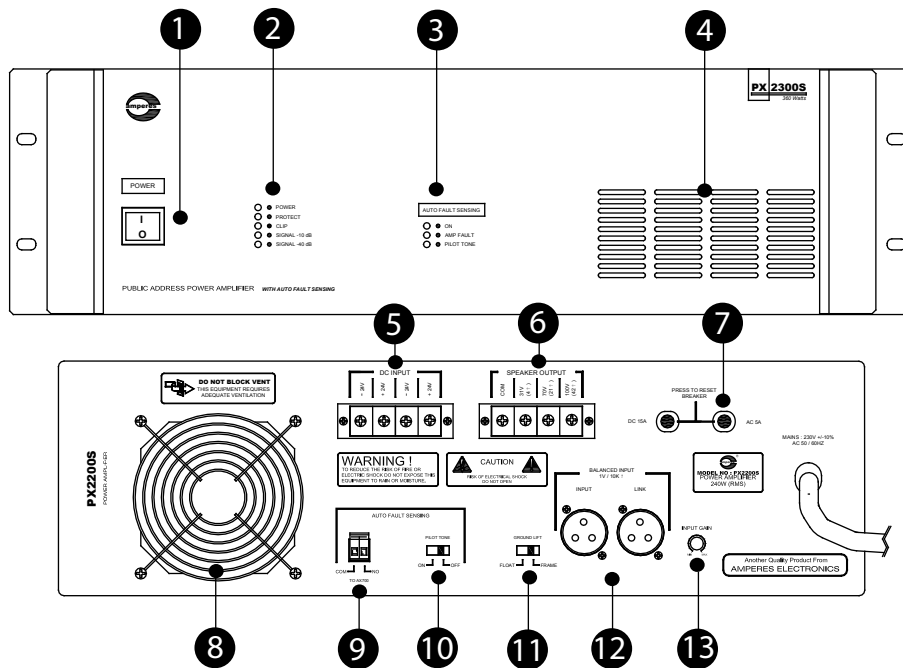
This product is equipped with a cord having an equipment grounding conductor and a grounding plug.

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, It 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 ventillation.
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.

PARTS IDENTIFICATION



- 1. AC POWER SWITCH** For switching mains ac supply and the corresponding LED shall lit. Mains LED shall not lit whenever only DC back up supply is connected.
- 2. INDICATION LEDS** Indication LEDs are : Power for incoming mains AC ; Protect LED to indicate that the unit is under protection mode when the temperature rises to a maximum level and the incoming signal is muted ; Clip to show that the incoming signal level is too high, typically above +4dB ; and Signal LEDs with two levels of -40dB and -10dB.
- 3. AFS INDICATORS** This optional feature - Auto Fault Sensing can be monitored via the LEDs. ON Led shows the the AFS is switched on ; Fault LED indicates that the unit is diagnosed as faulty ; and the Pilot Tone LED shall lit at intervals to indicate that a 20kHz signal is being sent and received to check the condition of the unit. Whenever a Pilot Tone signal is being sent, you shall notice that the signal level LED shall lit too. This is normal.
- 4. FRONT VENT** Ventillation holes for hot air which is blown out from the unit. Kindly ensure there is sufficient clearance for heat dissipation in your installation.
- 5. DC SUPPLY** Connect back up DC supply from batteries to the connectors using appropriate cable size. Check the rating of amplifier used and the corresponding cable load-size as undersize wire may cause cable overheat and eventually lead to fire.
- 6. SPEAKER OUTPUT** Speaker terminals are available in 4 Ohm, 70 and 100V line outputs. Use only one type of loading, ie. do not tap 70V output together with 100V line.

Total load should not exceed the capacity of the unit's rating. The total speakers combined should have impedance higher than stated in the corresponding output terminals to avoid overloading.

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

PARTS IDENTIFICATION

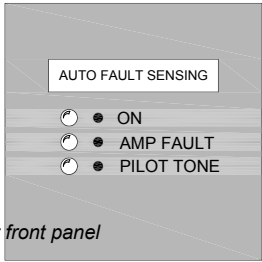
- 7. CIRCUIT BREAKERS** Manual resettable circuit breakers replaces the conventional fuse replacement, thus easier maintenance. AC circuit breaker is for the mains whereas the DC is for the internal DC voltage. To reset, simply press the button after any fault is removed.
- 8. VENT FAN** External cool air is drawn to the unit's heat sink via the dual speed fan. Whenever the heatsink temperature rises to above 45 deg celcius, the fan speed shall be automatically increased.
- 9. FAULT CONTACT** Whenever a faulty condition is detected, a dry contact shall be established. This port is connected to Amperes AX700 to enable changeover to take place. This terminal is NO in normal condition. Close contact is established too when the amplifier is switched off.
- 10. PT SWITCH** The AFS feature can be switched off if required. Switching it off shall render the unit to run as any other normal amplifiers. Switching it ON shall be indicated by the front AFS LEDs.
- 11. GROUND LIFT** The sliding switch allows separation of body earthing from signal common to prevent hum
- 12. INPUT JACKS** Incoming signal to the unit is via 3 pin XLR female socket and the adjacent male jack is connected parallel for linkage to the next unit.
- 13. VOLUME KNOB** Output volume is adjustable from -15dB to 0 dB.

NOTES

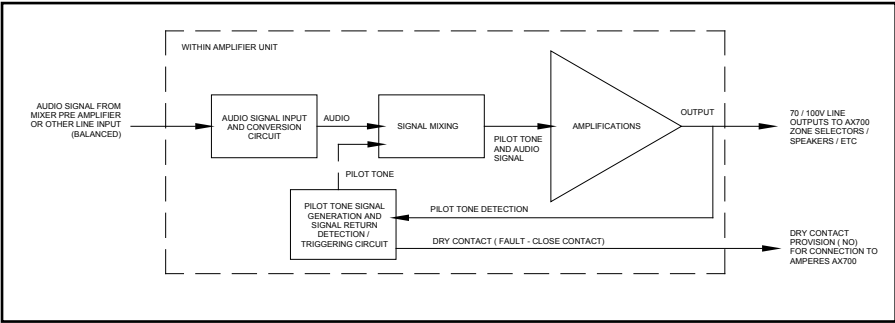
- EARTH LOOP** To avoid hum or noise to the output, the chassis earth and the electrical earth should be separated by switching Ground Lift Switch (11) located at the rear panel.
- MICROPHONE INPUT** The signal input to the amplifier should be line level balanced type using XLR connector. Balanced signal generally cause less noise as compared to unbalanced type. Should an unbalanced signal is to be connected, short the pin 1 and 3 together at the XLR jack. Always remember to have either both ends of cable in balanced or unbalanced mode to avoid undesired results.
- SPEAKER CONNECTION** Total speakers connected to the output terminals should not exceed the unit's 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 onsume half of the power. Thereby, twice the number of speakers of the said rating can be connected to the 70V line terminal.
- SPEAKER POLARITY** Speakers with '+' terminal should be connected to 100V line output. Sound clarity may be compromised when anti phase connections are made and is apparent when they are installed closed to each other.

INTRODUCTION TO AUTO FAULT SENSING (AFS)

AFS forms an integral part of Amperes PX series of amplifiers and thus eliminates the need to add external module for the monitoring of the power pack. This does not only reduces the cabling complexities but also in overall cost of installation. Connecting the PX amplifiers to Amperes AX auto changeover panel shall then form an automatic amplifier monitoring system which initiates a standby amplifier takeover, thus ensuring continuous and uninterrupted paging setup.



AFS indications located at front panel



Block diagram showing the concept of AFS function employed by PX series amplifiers.

The above block diagrams shows a general method of monitoring the condition of the power amplifiers. Some manufacturers may have different version of sensing but in general, the above concept applies.

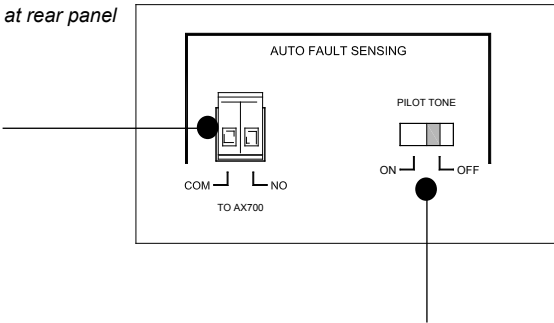
Amperes PX series differs from the rest by only injecting Pilot Tone at intervals. This may cause a slight delay in detection of faults but in the long run, it may prevent premature amplifier failure. At cool intervals when pilot tone is not injected, it means that no signal shall appear and thus no loading. Continuous PT injection may result in faster detection, however, it means continuous loading too. Although PT is not audible (20 KHz), it does present at the speaker ends and this represents pushing the unit to work all the time even though audio signal is not injected.

Amperes identifies the setback of continuous monitoring, thereby we employ a moderate method, ie. to inject at intervals. *** request for continuous monitoring can be fulfilled upon request.

AFS section at rear panel

For a complete setup, link PX amplifiers to Amperes AX700 with the contact port connected to the corresponding triggering terminal at the latter.

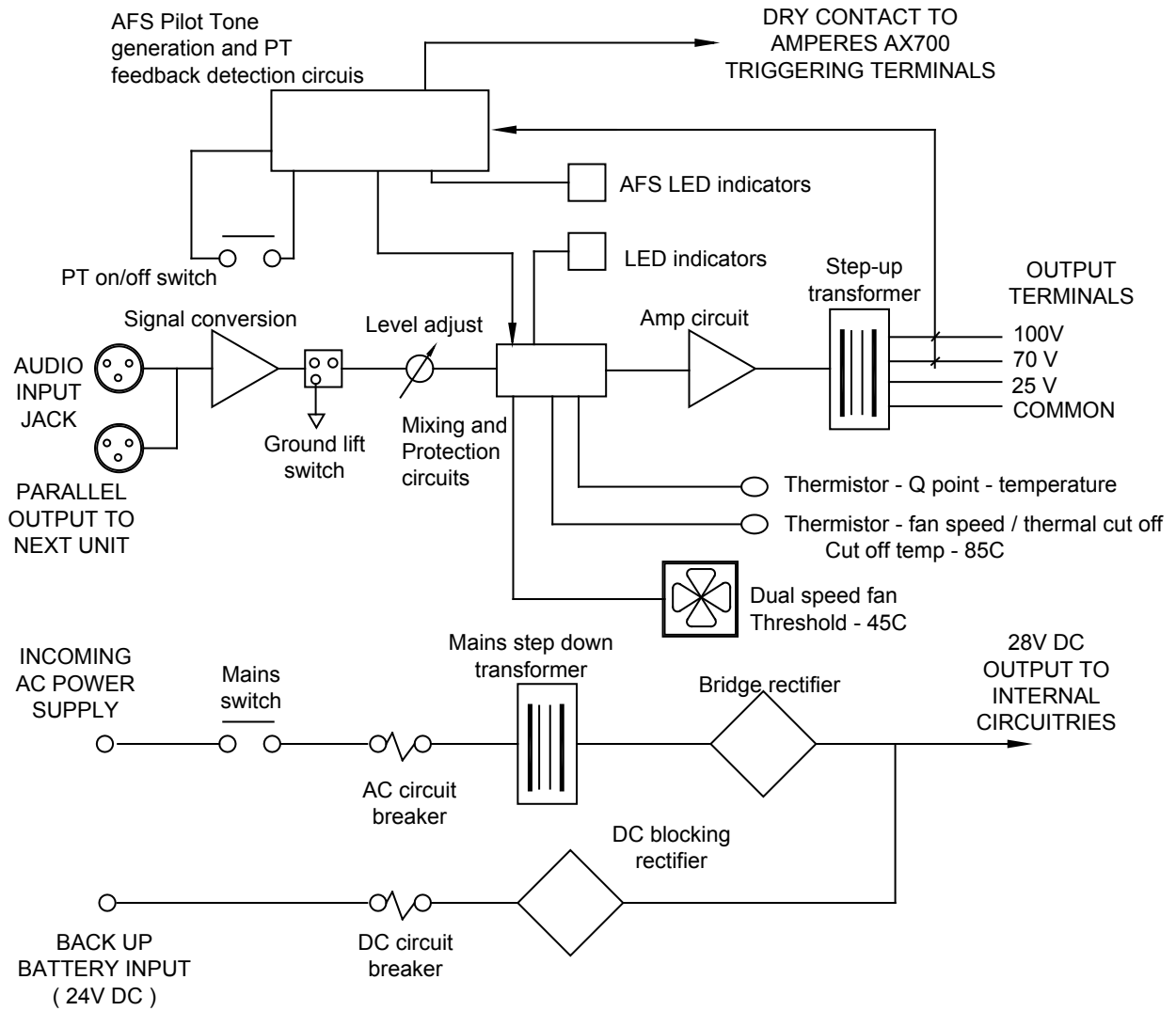
The quantity of AX700 shall be according to the number of amplifiers available in the system. Each AX700 can cater for 6 ut duty and 1 standby amplifiers. Cascade AX700 if necessary.



The standard feature available in PX series can be switched off if required, thereby rendering the unit to be operating like any other type of normal amplifiers.

This can be done by sliding the switch to OFF position. In this condition, the front section AFS LED indicators shall be turned off as well.

BLOCK DIAGRAM



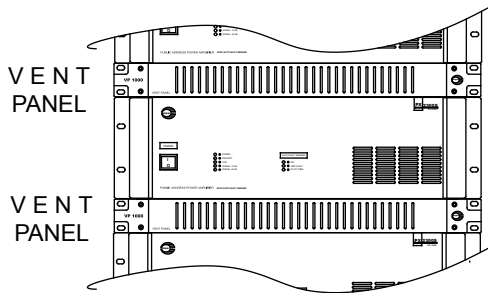
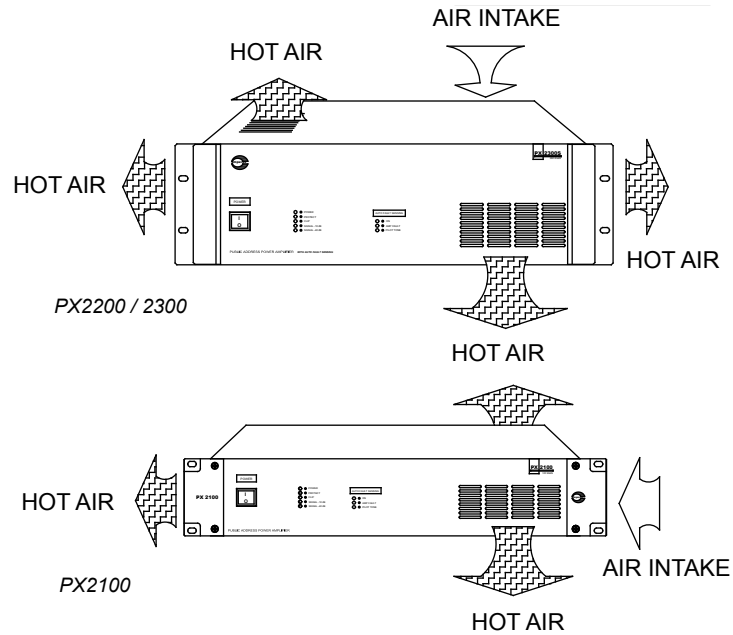
The above block diagram is illustrative only and does not represent the actual or detailed construction schematic. Detailed circuit shall be available only to our authorised service centres.

INSTALLATION

The diagrams show the air intake and heat dissipation patterns of the amplifiers.

Please note that the intake pattern for PX2100 differs from PX2200 and PX2300.

It is recommended that a minimum space of 100 mm be made available at each vent hole to allow a comfortable breathing clearance.



In rack installation, where large quantities of amplifiers are to be installed, it is recommended that a ventilation panel to be mounted on top of each unit.

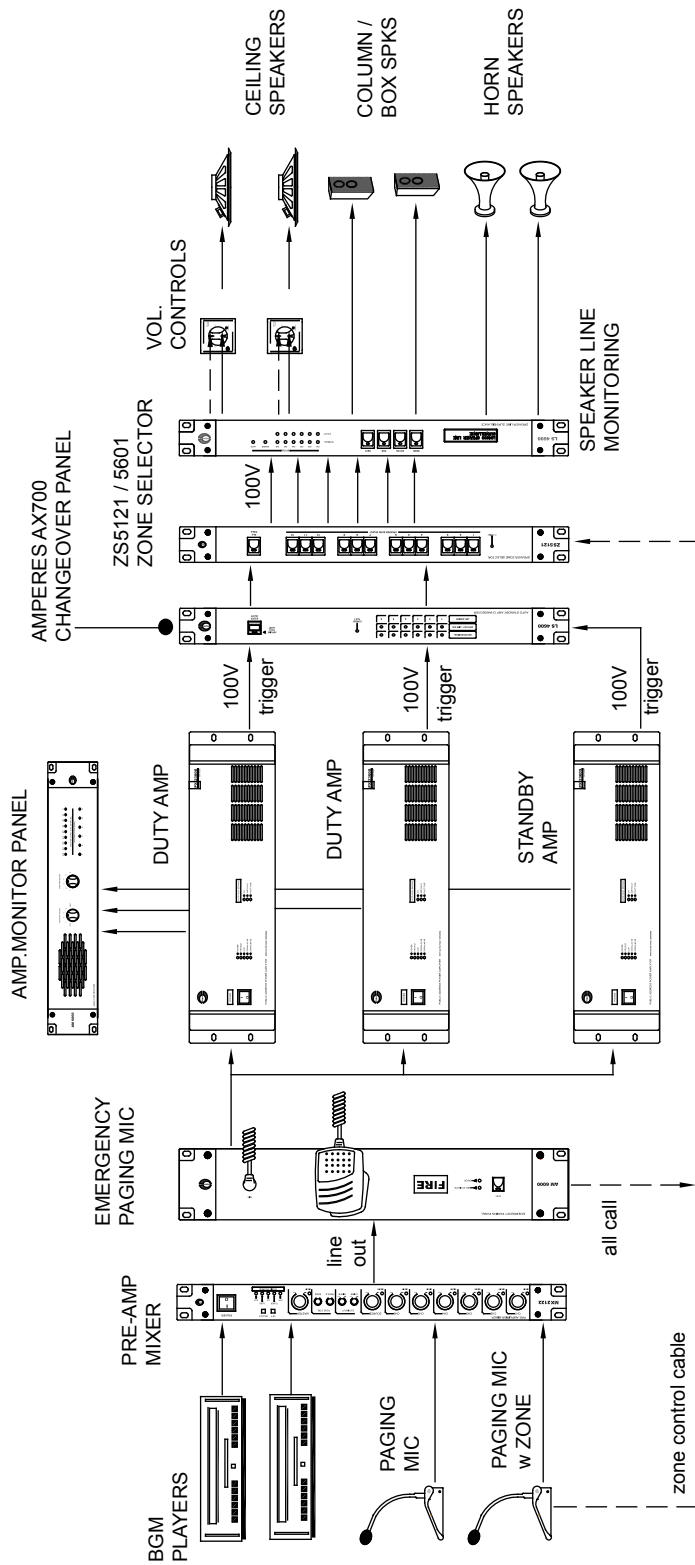
On top of the rack, a suction fan should be installed to draw off warm air produced by the amplifiers.

Rear panels or door of the rack should be vented and in some cases, a suction fan should be installed to allow better air flow within the enclosed area.

Optimum operating temperature of the power pack shall be below 45 ~50 deg C. The temperature measured is referred to the exit end of the heat sinks where thermistors are located.

Do not be alarmed when the fan speed rises above normal as this is activated automatically when the internal temperature rises above 45 deg C. Under extreme condition, the unit shall be muted when the heat rises to 85 deg C. This can be caused by accumulated heat around the units which is then blown back to the amplifiers due to poor ventilation design... or if the output from the amplifier is shorted which causes the heat to rise exponentially.

SCHEMATIC - NORMAL PAGING SETUP

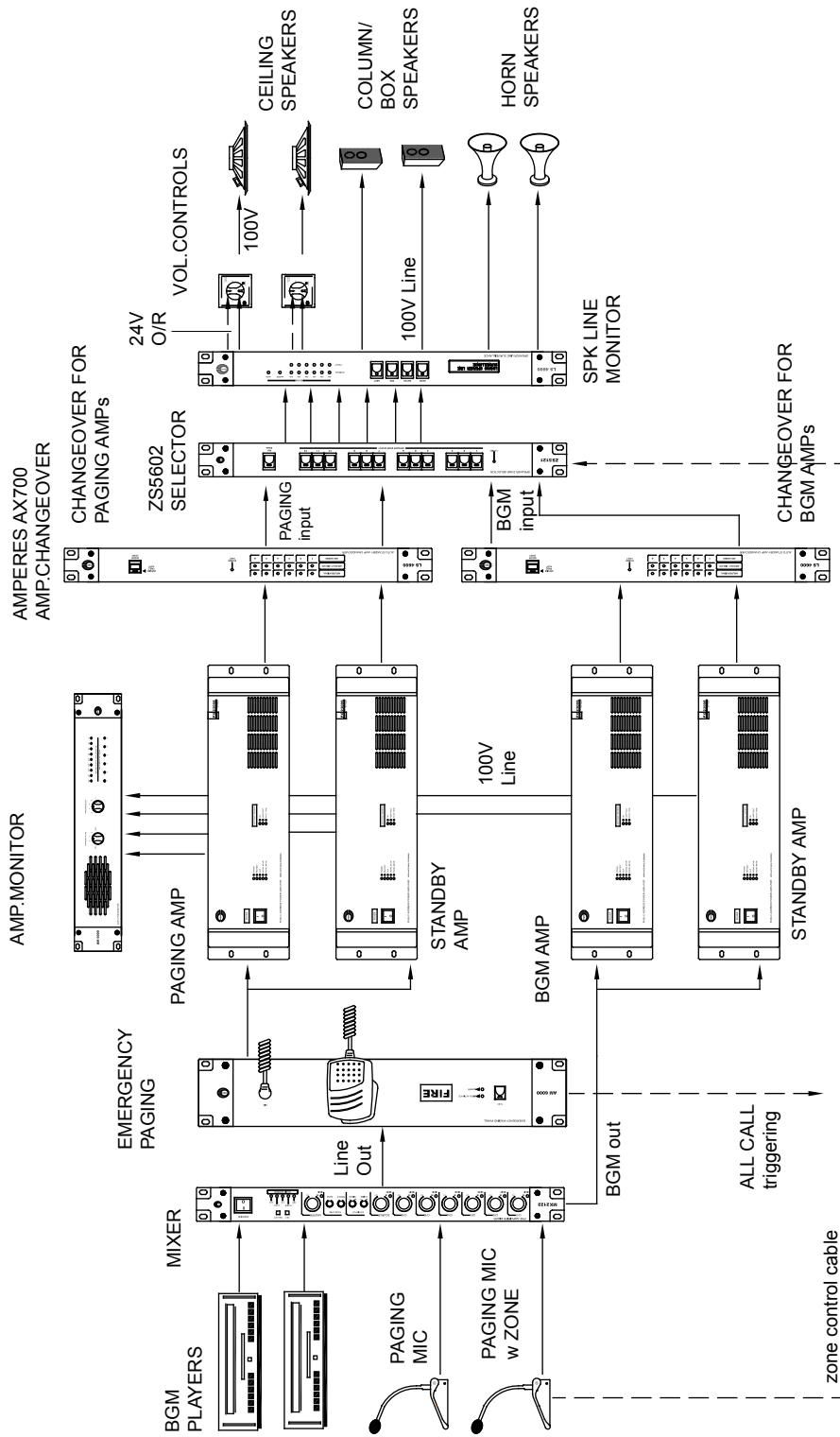


The above schematic shall be the most common setup found - with single audio paging output. For larger setup, please add line distribution unit after the emergency paging panel.

In addition, Equaliser can be added before each power amplifier to cater for different acoustic environments at the different zones.

Some equipment may require 24V DC power supply. (Not shown in drawing). It is normal that back up batteries need to be installed in the system as mandatory requirement by local authorities.

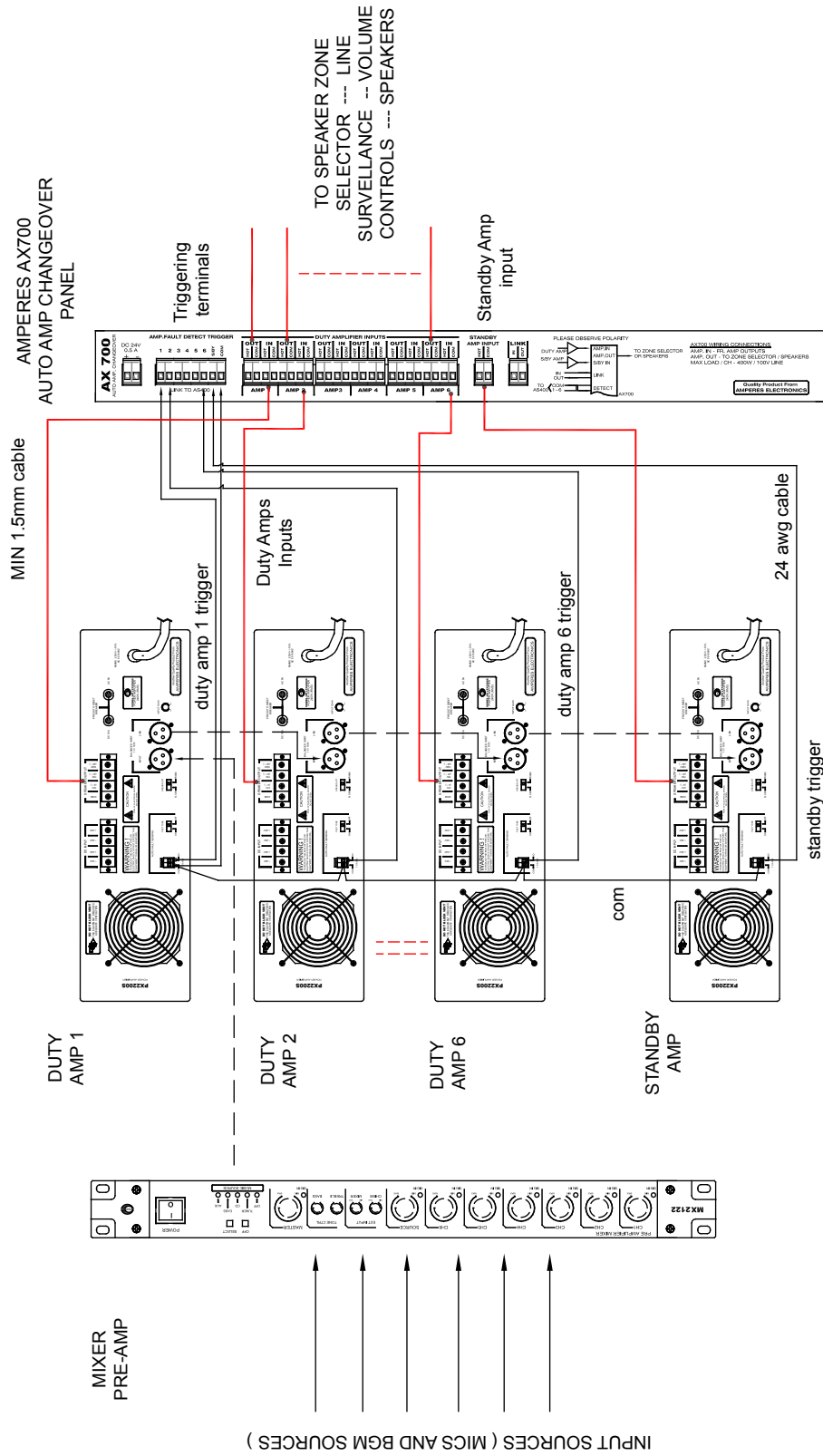
SCHEMATIC - UNINTERRUPTED PAGING SETUP



The above schematic illustrates an uninterrupted paging setup serving six zones. 2 sets of amplifier ; BGM and Paging are required, each with its own standby amplifier changeover. In many cases, this may not be economical and it is normal to have BGM power packs without a standby unit. Therefore, you may only need one AX700 in the system.

For large setup with amplifiers exceeding 6 units, it is advisable to add line distributor after the emergency paging panel as too much signal paralleling may cause undesirable distortion to the output.

CONNECTIONS



The above example shows a system using 6 duty amplifiers with 1 standby with direct paging setup. ie. at any one time, either a paging or BGM is allowed to be broadcasted to all zones. Cascade AX700 if necessary when the number of duty amplifiers exceeds 6 unit with only 1 standby power pack.

Other additional equipments may be added but not shown such as back up batteries, amplifier monitor panel, speaker zone selectors, volume controllers, etc.

TECHNICAL SPECIFICATIONS

ELECTRICAL

Power requirement	AC 230/240V : 50/60 Hz 24V DC : PX2100S - 6A ; PX2200S - 19A PX2300S - 29A ; PX2400S - 35A
Rated output	PX2100S : 120W 100V line PX2200S : 240W 100V line PX2300S : 360W 100V line PX2400S : 480W 100V line
Output impedance / line	PX2100S : 4 ohm (22V) / 42 ohm (70V) / 83 ohm (100V) PX2200S : 4 ohm (31V) / 21 ohm (70V) / 42 ohm (100V) PX2300S : 4 ohm (38V) / 13.6 ohm (70V) / 27.8 ohm (100V) PX2400S : 4 ohm (44V) / 10 ohm (70V) / 21 ohm (100V)
Power consumption	PX2100S : No input - 30VA, Rated output - 230 VA PX2200S : No input - 38VA, Rated output - 720 VA PX2300S : No input - 40VA, Rated output - 1080 VA PX2400S : No input - 40VA, Rated output - 1180 VA
Input sensitivity	1V / 10 K Ohm
Input gain control	-15 dB to 0 dB
Input connections	XLR balanced input
Frequency Response	80 - 17 kHz 0/-5 dB
Signal / Noise ratio (at 1 KHz, 0 dB)	> 80 dB
Protections	Thermal overload muting / AC and DC manual reset circuit breaker / Momentary short circuit
Indicators	Input Mains ; Clip ; Protect mode ; Input signal
Cooling system	Fan forced cooling with dual speed thermal controlled presets
AUTO FAULT DETECTION	
Detection interval	10 seconds
Detection response	15 - 25 seconds
Detection method	Internal pilot tone at 20 kHz
Failure recovery time	20 seconds max
Failure output	Dry contact (NO at 3Arating)
PHYSICAL	
Dimensions (H x W x D mm)	PX2100S (88x482x300) mm PX2200S / PX2300S / PX2400S (133x482x300) mm
Weight	PX2100S - 11.6kg : PX2200S - 21kg : PX2300S - 24.2kg : PX2400S - 29kg
Colour	Black ; powder epoxy coated

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.



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 or its authorized master distributor, Amperes Global Marketing. 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 12 months from the date of purchase or for a longer 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.

