



INSTALLATION AND OPERATION MANUAL

ES SERIES

MIXER AMPLIFIERS

ES60

ES120

ES250



IMPORTANT SAFETY INFORMATION

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.
15. This appliance shall not be exposed to dripping or splashing water and that no object filled with liquid such as vases shall be placed on the apparatus.
16. Plug this apparatus to the proper wall outlet and make the plug to be disconnected readily operable.
17. Mainsplug is used as disconnected device and it should remain readily operable during intended use. In order to disconnect the apparatus from the mains completely, the mains plug should be disconnected from the mains socket outlet completely.
18. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
19. An appliance with a protective earth terminal should be connected to a mains outlet with a protective earth connection.
20. The apparatus should be disconnected from the mains completely before speaker wiring. The speaker output should be proper protected from direct contact and pay attention to speaker connections, terminals and speaker wiring during normal operation.



PRÉCAUTIONS DURANT UTILISATION

1. LISEZ ces instructions.
2. Tenez ces instructions.
3. Notez tous les avertissements.
4. Suivez toutes les avertissements.
5. N'utilisez pas ce produit près de l'eau (la piscine, la plage, le lac, etc.).
6. Nettoyez seulement avec une étoffe sèche.
7. Ne bloquez aucuns trous de ventilation. Installez en accord avec les instructions du fabricant.
8. N'installez près aucunes sources de chaleur comme radiateurs, registres de chaleur, fours ou les autres équipements (y compris ampli cateurs) qui produisent la chaleur.
9. Ne défaites pas le but de sécurité de la fiche polarisée ou base-type. Une fiche polarisée a deux tranchants avec un plus large que l'autre. Une fiche de base type a deux a deux tranchants et une troisième pointe de base, le tranchant large ou la troisième pointe est fourni pour votre sécurité. Si la fiche donnée ne conforme pas votre prise de contact, consultez un électricien pour remplacement de la prise de contact obsolète.
10. Protégez le cordon de secteur contre être marchée dessus ou pincez en particulier aux fiches, aux douilles de convenance, et au point où ils sortent de l'appareil.
11. Seulement utilisez attachements/accessoires spécifiés par le fabricant.
12. Utilisez seulement avec un chariot, un stand, un trépied, un support ou une table indiquée par le fabricant, ou vendue avec l'appareil. Quand un chariot est utilisé, faites attention en déplaçant la combinaison d'appareil/chariot pour éviter de se déséquilibrer.
13. Arrachez la fiche du dispositif durant éclair et orage ou quand pas utilisé pour longues périodes de temps.
14. Référéz au personnel qualifié de service pour toutes réparations. La réparation est donnée quand le système a été endommagé à n'importe façon, par exemple un fil ou une fiche endommagé(e) de la source d'alimentation. Avoir été exposé à pluie ou humidité, n'opère pas normalement, ou avoir été tombé.
15. L'appareil ne doit pas être exposé aux écoulements ou aux éclaboussures et aucun objet ne contenant de liquide, tel qu'un vase, ne doit être placé sur l'objet.
16. Branchez l'appareil à une source appropriée et faire que la prise à débrancher soit facilement accessible.
17. La prise du secteur ne doit pas être obstruée ou doit être facilement accessible pendant son utilisation. Pour être complètement déconnecté de l'alimentation d'entrée, la prise doit être débranchée du secteur.
18. AVERTISSEMENT: Pour éviter le risque d'incendie ou de chocs électriques, ne pas exposer cet appareil à la pluie ou à l'humidité.
19. Un appareil avec la borne de terre de protection doit être connecté au secteur avec la connexion de terre de protection.
20. Assurez-vous que l'appareil est hors tension avant de connecter les hauts parleurs. Vérifiez que la sortie des enceintes soit protégées contre un contact physique. Respecter les polarités des terminaux ainsi que le câblage des enceintes pendant le fonctionnement afin d'assurer une utilisation sécurisée.



INTRODUCTION & CONTENTS

ES SERIES

Congratulations on choosing Australian Monitor for your professional amplification requirements.

Available in 60, 120 and 250 watt versions, the ES series are 1 or 2 RU mixer amplifiers, featuring 100 volt line and 4 ohm outputs, 4 universal mic/line inputs and record and line outputs.

Master volume with treble and bass controls are provided, along with VOX triggered muting (defeatable) on channels 1 and 2 giving priority over inputs 3 and 4. In addition, a 5 tone generator is included in the ES120 and ES250 models.

The Australian Monitor ES series gives the contractor a low cost solution in applications that are price sensitive but still require a high quality of sound reproduction and reliability.

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WARNING

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT USE THE PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

TO PREVENT ELECTRICAL SHOCK, MATCH WIDE BLADE PLUG TO WIDE SLOT & FULLY INSERT.

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.



The lightning flash with arrowhead symbol, 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 of sufficient magnitude to constitute a risk of electric shock to persons.



WARNING

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



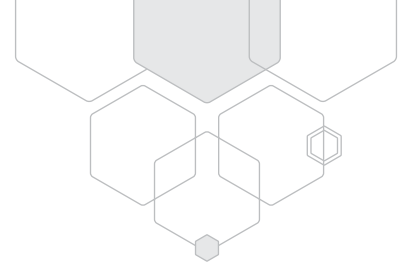
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance



For European Union countries: This symbol on the product or its packaging indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. Please contact your local authority for further details of your nearest designated collection point.

Rating plate and caution marking are marked on the back enclosure of the apparatus

FEATURES & PROTECTION FEATURES



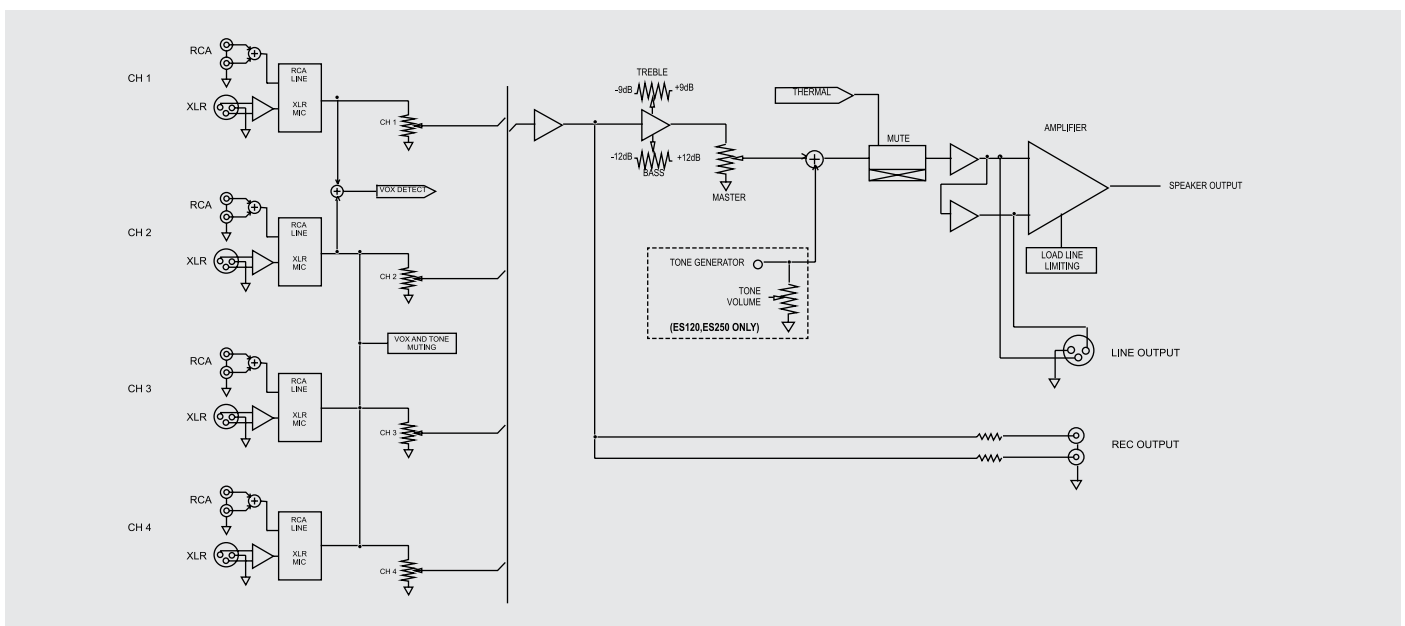
FEATURES

- ES60 - 1 x 60W
ES120 - 1 x 120W
ES250 - 1 x 250W
- 4 Channel Mixer
- 4 XLR Microphone/Dual RCA Line Inputs
- 100V and 4Ω outputs
- 2 channel priority muting (VOX) (externally defeatable)
- 12VDC Phantom power
- Bass and Treble Tone Controls
- Record Output
- Line Output
- Integrated 5 Tone Generator with volume control (ES120 and ES250)
 - Evac
 - Alert
 - Intruder
 - Bell
 - Chime
- Rack mount size
 - 1 RU for ES60
 - 2 RU for ES120/250

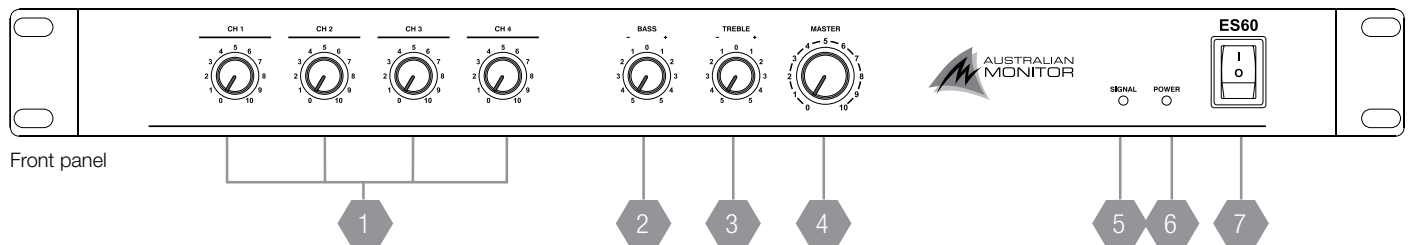
PROTECTION FEATURES

- Short-circuit protection
- Overload protection
- Thermal protection

ES AMPLIFIER BLOCK DIAGRAM



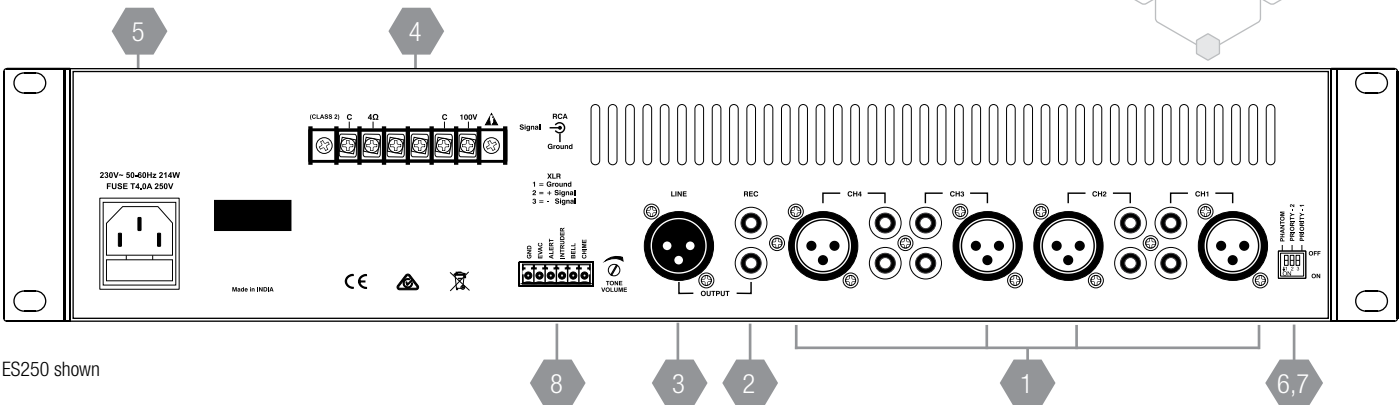
FRONT PANEL



ES60 shown

- 1** CH 1-4
These control the levels for each channel input.
- 2** BASS
There is 12dB of cut and boost at 100Hz.
- 3** TREBLE
There is 9dB of cut and boost at 10kHz.
- 4** MASTER
This controls the overall mixed output level.
- 5** SIGNAL
This LED indicates the unit is outputting a signal.
- 6** POWER
This LED indicates the unit is on.
- 7** POWER SWITCH
This switches the power to the unit on and off. The up position is on.

REAR PANEL



1 CH 1-4
Each channel input section has two inputs:
XLR input – This is a balanced microphone input with an input sensitivity of 1.2mV.
RCA input – This is an unbalanced line level input. It has an input sensitivity of 160mV. The two RCA sockets are summed to mono internally.

2 REC OUTPUT
The REC output is on unbalanced RCA connectors. The output level is 220mV into 10kΩ at rated output. The output is dual mono.
NOTE: The output is not affected by the MASTER volume control or the BASS and TREBLE controls.
The output also does not receive the signal from the tone generator.

3 LINE OUTPUT
The LINE output is on a balanced XLR connector. The output level is 0.775V into 1kΩ at rated output.
NOTE:
The tone generator output will also be fed into the line output if activated.
When wiring the LINE output as unbalanced, Pin2 should be wired as hot and Pin1 should be wired as ground/ shield. Do not wire Pin3.

4 SPEAKER OUTPUT
Speaker connections are provided on screw terminals. 4Ω low impedance and 100V.
IMPORTANT: If you are using the 100V output you must connect the jumper link between 4Ω and OT-IN. (ES60 and ES120)

MINIMUM IMPEDANCE	ES60	ES120	ES250
DISTRIBUTED LINE OUTPUT 100V	166Ω	83Ω	40Ω
LOW IMPEDANCE OUTPUT	4Ω	4Ω	4Ω

NOTE: Only connect one output – either 4Ω or 100V. Do not connect 4Ω and 100V at the same time.

5 IEC MAINS INPUT SOCKET
This is a standard IEC 60320-C14 socket. It accepts a standard IEC mains cable, provided. The fuse drawer contains the mains fuse and a spare. Consult the specification section for fuse ratings.

 Always replace the fuse with one of the same value and type.  Always disconnect power to the amplifier before replacing fuses.

6 PHANTOM POWER
12V phantom power is available for condenser or electret microphones on the XLR input when this switch is pushed down.

REAR PANEL CONT.



tone volume

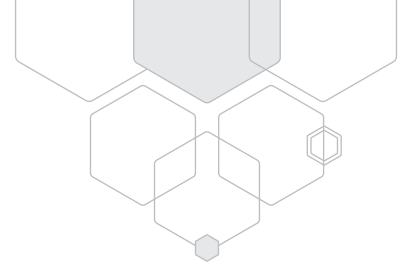
The tone volume is controlled using the 'TONE VOLUME' control on the back panel. Increase the volume by turning the POT clockwise and counter-clockwise to decrease the volume. The MASTER volume control does NOT affect the tone volume.

IMPORTANT: Do NOT drive external voltages into the pins as damage to the unit will occur.

tones

1. 'EVAC': a long continuous repeating tone with a ramped frequency. Triggered by shorting EVAC to GND, the sound will continue to repeat until the short is released.
2. 'ALERT': a short tone burst tone repeated every 0.5s. Triggered by shorting ALERT to GND, the sound will continue to repeat until the short is released.
3. 'INTRUDER': a two tone 'low' 'high' alert repeating every 0.4s. Triggered by shorting INTRUDER to GND, the sound will continue to repeat until the short is released.

INSTALLATION



POWER REQUIREMENTS

Power consumption for your model of the ES series amplifier is indicated on the rear panel for 1/8th output power. Ensure that your mains voltage is the same as the rear panel mains voltage marker (+/- 10%).

MOUNTING

The ES Series amplifiers are one or two rack units high (1U) (2U) and will fit a standard EIA 19" or rack. Typically amplifiers may be stacked directly on top of each other with no need for spacing between units, unless installed in high ambient temperature environments where a single rack unit space between amplifiers will assist cooling further.

COOLING

The mixer amplifiers are cooled by axial fans which draw air inside the amplifier and expel the heated air outside the amplifier. An unrestricted airflow into and out from the amplifier must be provided. Any restriction of the air flow will cause heat to build up within the unit and possibly force the unit into its thermal shutdown mode. If the amplifiers are to be operated in an environment where the airflow is restricted such as sealed racks, cooling should be supplemented by extra cooling fans to evacuate the heated air and aid the flow of cool air through the unit.

OUTPUT WIRING

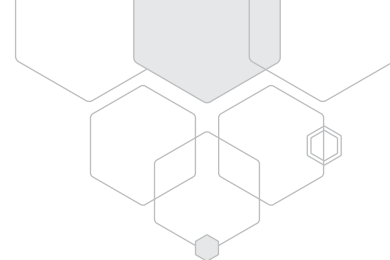
When wiring to your speakers always use the largest gauge wire your connector will accept. The longer the speaker lead the greater the losses which will result in reduced power and less damping at the load. We recommend using a heavy duty, two core flex (four core flex if bi-amping) 10 to 12 gauge (2mm² to 2.5mm² or 50/0.25 or equivalent) as a minimum.

SPEAKER OUTPUT

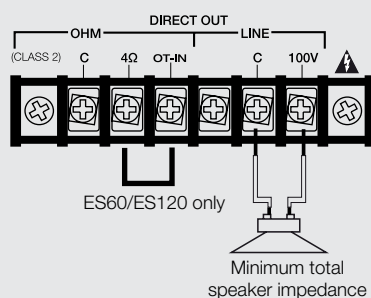
The output terminal strip accepts wire sizes from 16-22AWG (1.5mm² – 0.35mm²) or spade lugs. The following table should be used as a guideline for cable sizes. Regulations in your area may require different gauged wire and should be checked before using.

OUTPUT	DISTANCE	ES60	ES120	ES250
100V	Upto 50m	AWG26(0.12mm ²)	AWG24(0.2mm ²)	AWG22(0.35mm ²)
	50m - 200m	AWG20(0.5mm ²)	AWG18(0.75mm ²)	AWG16(1.5mm ²)
	Over 200m	AWG18(0.75mm ²)	AWG16(1.5mm ²)	AWG13(2.5mm ²)
4 ohm	Upto 10m	AWG18(0.75mm ²)	AWG18(0.75mm ²)	AWG18(0.75mm ²)
	10m - 30m	AWG13(2.5mm ²)	AWG13(2.5mm ²)	AWG13(0.35mm ²)
	Over 30m	Not Recommended	Not Recommended	Not Recommended

INSTALLATION CONT.

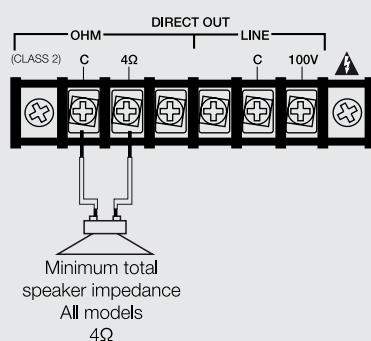


100V LINE



ES60	ES120	ES250
166Ω	83Ω	40Ω

4Ω VOICE-COIL



NOTE: Only connect one output – either 100V or 4Ω

LINE OUTPUT

The LINE output XLR can be used to connect up to 6 booster amplifiers.

Balanced wiring (shielded pair cable) is recommended.

NOTE: When wiring the LINE output as unbalanced, Pin2 should be wired as hot and Pin1 should be wired as ground/shield. Do not wire Pin3.

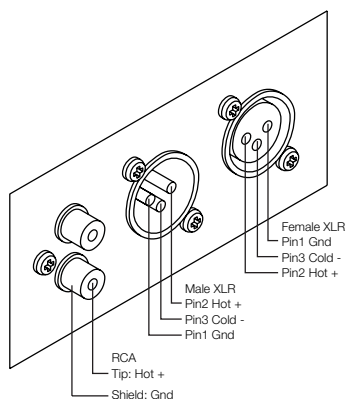
REC OUTPUT

The REC output wiring should be kept as short as possible.

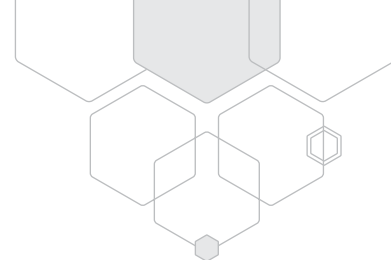
INPUT CONNECTIONS

For wiring balanced in, pin 2 is hot. Unbalanced wiring on the microphone inputs is not recommended.

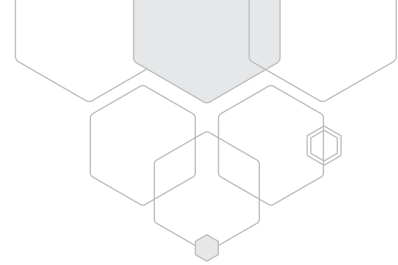
Balanced input wiring (shielded pair cable) is recommended. Unbalanced RCA wiring should be kept as short as possible.



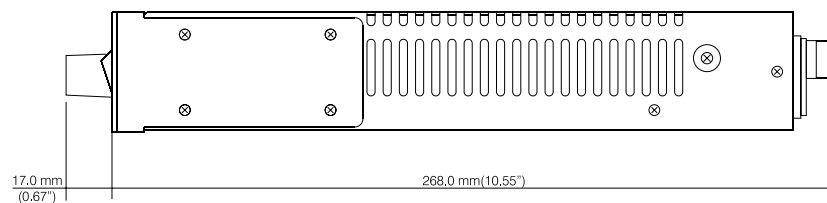
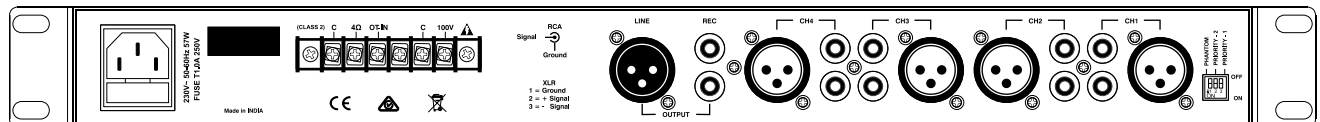
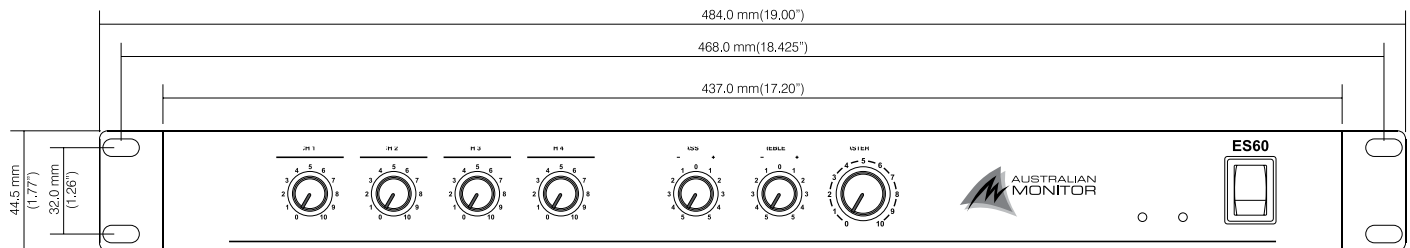
TROUBLESHOOTING

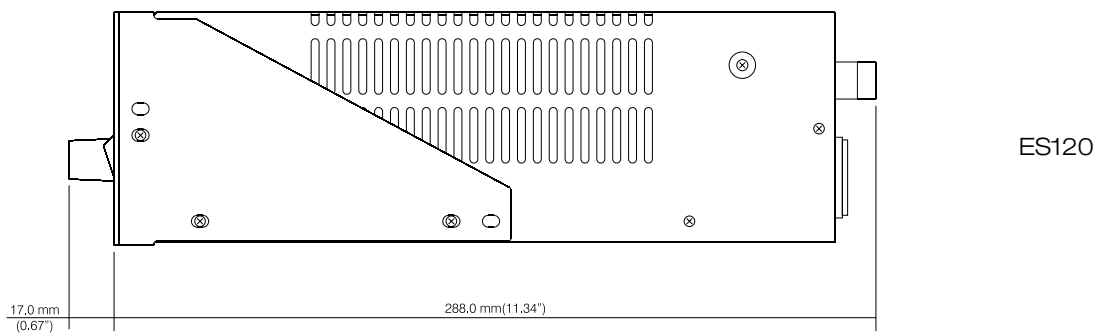
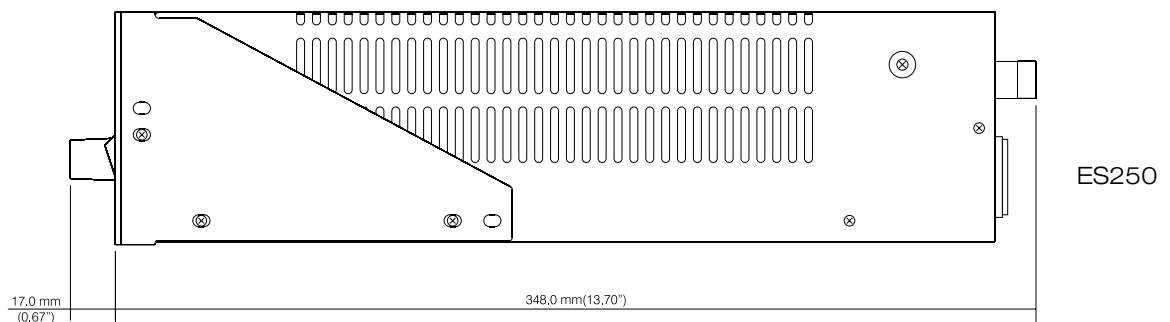
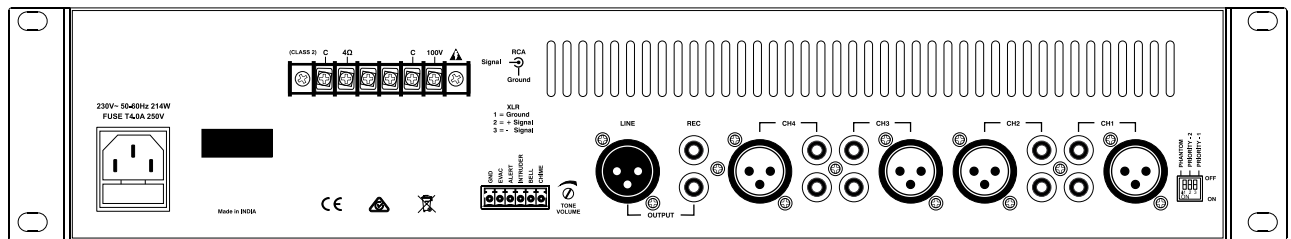
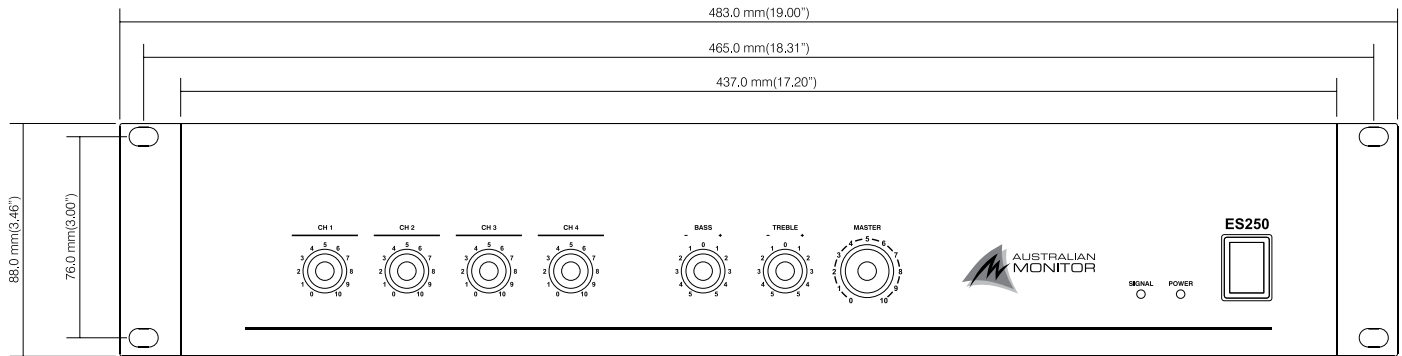


TROUBLE	LIKELY CAUSE	REMEDY
Power LED not on	Power not reaching amplifier	Check power switch is on Check mains connection Check mains fuse
Distorted sound	Output is short circuit Input is overloaded Output is being over driven Bass control is turned up	Check speaker loads for shorts Reduce input level at source Reduce volume levels on front panel Reduce Bass control level
No sound but amplifier is on	Volume controls down Amplifier has overheated DC fuse(s) blown	Check volume controls Check for obstructions above and below Make sure the amplifier is well ventilated Refer product to local Australian Monitor dealer
No sound from channels 3 and 4	Priority function is being used	Remove signal (disconnect input) from channel 1 and 2 OR Disable priority function using DIP switches on the rear panel.
Tones do not sound when triggered	Tone generator volume too low	Increase the volume by turning the tone volume clockwise

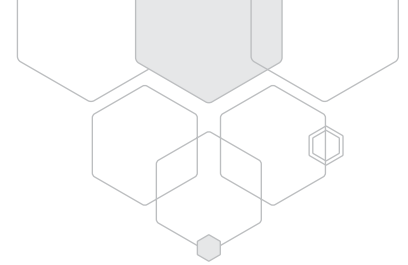


DIMENSIONS: ES60



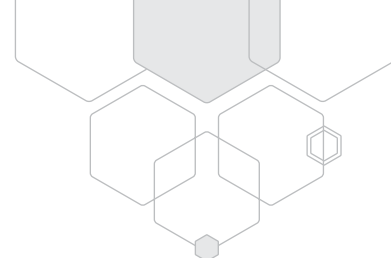


SPECIFICATIONS



	ES60	ES120	ES250	
TOPOLOGY	Class-AB		Class-B	
CHANNELS	1			
POWER OUTPUT 4Ω 100V CONTINUOUS POWER RATING	65W 62W 30W	130W 120W 60W	285W 290W 125W	1kHz. 1%THD. -10W/+10W 1kHz. 1%THD. -10W/+10W 240Vac, 40C Ambient
MAXIMUM OUTPUT VOLTAGE	16.12Vrms	22.8Vrms	33.76Vrms	4Ω Output, 230Vac
SYSTEM GAIN	39.7dB (Line), 82.2dB (MIC)	42.7dB (Line), 85.2dB (MIC)	45.9dB (Line), 88.4dB (MIC)	
FREQUENCY RESPONSE 4Ω	40Hz ~ 20kHz	30Hz ~ 20kHz	40Hz ~ 20kHz	3dB below clipping, +0/-3dB.±5Hz
FREQUENCY RESPONSE 100V	65Hz ~ 19.5kHz	55Hz ~ 20kHz	40Hz ~ 20kHz	3dB below clipping, +0/-3dB.±5Hz Low Frequency ±2kHz High Frequency
SIGNAL TO NOISE RATIO	>82dBr	>85dBr	>80dBr	All pots centre, Max Output, 1kHz, 20kHz BW, A-Weighted
THD+N. 1kHz	0.2%	0.2%	0.3%	3dB below clipping, 1kHz. 20kHz BW, Unity Gain, A-Weighted, Inputs at centre posistion
THD+N. 4Ω. FREQ BAND	0.2% (40Hz ~ 20kHz)	0.2% (30Hz ~ 20kHz)	0.4% (40Hz ~ 20kHz)	3dB below clipping, Freq Band. 20kHz BW, Unity Gain, A-Weighted, Inputs at centre position
THD+N. 100V. FREQ BAND	0.2% (40Hz ~ 20kHz)	0.2% (40Hz ~ 20kHz)	0.65% (40Hz ~ 20kHz)	3dB below clipping, Freq Band. 20kHz BW, Unity Gain, A-Weighted
DC OUTPUT OFFSET	< 50mV		N/A	4Ω Output
SENSITIVITY				
AUDIO INPUT SENSITIVITY	160mVrms (Line), 1.2mVrms (MIC)			Rated Power, 100V Output
AUDIO INPUT MAX LEVEL	16Vrms (Line), 115mVrms (MIC)			
RECORD OUTPUT	220mV			10kΩ Termination.
LINE OUTPUT	760mV			1kΩ Balance Termination. Measured across hot and cold
PHANTOM POWER	12VDC @ 15mA per input pin			
INPUT/OUTPUTS				
AUDIO INPUT	MIC - Balanced XLR per channel LINE - Unbalanced stereo RCA per channel			
RECORD OUTPUT	Unbalanced Stereo RCA			
LINE OUTPUT	Balanced XLR			
SPEAKER OUTPUT	6 pin Screw Terminal per channel			

SPECIFICATIONS CONT.



	ES60	ES120	ES250	
POWER REQUIREMENTS				
AC INPUT	230Vac, 50-60Hz			±10%
AC POWER FACTOR	>0.85	>0.83	>0.8	Max Output, 1kHz, 230Vac
AC INPUT CONNECTOR	IEC 60320-C14			
AC MAINS FUSE	T1AH 250V	T2AL 250V	T4AL 250V	
MAXIMUM INRUSH CURRENT	9A	12A	25A	230VAC, 50Hz
RMS CURRENT DRAW				
IDLE	0.06A	0.06A	0.26A	230Vac, 50Hz, 100V Output, 1kHz, Sine
1/8TH POWER	0.325A	0.56A	1.23A	
1/3RD POWER	0.476A	0.84A	1.8A	
FULL POWER	0.73A	1.28A	2.85A	
POWER CONSUMPTION				
IDLE	8	9	33	230Vac, 50Hz, 100V Output, 1kHz, Sine
1/8TH POWER	57	95	214	
1/3RD POWER	88	146	314	
FULL POWER	143	241	528	
EFFICIENCY				
1/8TH POWER	13%	16%	15%	230Vac, 50Hz, 100V Output
1/3RD POWER	23%	27%	27%	230Vac, 50Hz, 100V Output
FULL POWER	42%	50%	47%	230Vac, 50Hz, 100V Output 1kHz, Sine
THERMAL DISSIPATION				
IDLE	27	31	113	Excludes Load Power (1W = 3.412BTU/Hr)
1/8TH POWER	169	273	589	
1/3RD POWER	232	362	787	
FULL POWER	283	413	949	
PRODUCT DIMENSIONS (WITH RACK EARS)	484mm x 285mm x 44.5mm (19.0"W X 11.2"D X 1.75"H)	483mm x 305mm x 88mm (19.0"W x 12"D x 3.5"H)	483mm x 365mm x 88mm (19.0"W x 14.4"D x 3.5"H)	
PRODUCT DIMENSIONS (WITHOUT RACK EARS)	437mm x 285mm x 44.5mm (17.2"W x 11.2"D x 1.75"H)	437mm x 305mm x 88mm (17.2"W x 12"D x 3.5"H)	437mm x 365mm x 88mm (17.2"W x 14.4"D x 3.5"H)	
SHIPPING DIMENSIONS	541mm x 376mm x 111mm (21.3W x 14.8"D x 4.4"H)	541mm x 396mm x 156mm (21.3W x 15.6"D x 6.14"H)	545mm x 460mm x 160mm (21.5W x 18.1"D x 6.3"H)	
NET WEIGHT	5 Kg (11lbs)	7.1 Kg (15.7 lbs)	11.8 Kg (26 lbs)	
SHIPPING WEIGHT	7 Kg (15.4 lbs)	9.4 Kg (20.7 lbs)	12.7 Kg (28 lbs)	
MOUNTING	1RU	2RU		
OPERATING TEMPERATURE	0°C to 40°C (95% RH)	0°C to 40°C (95% RH)		
COOLING SYSTEM	Fan assisted convection cooling			
FINISH	Powder Coated Steel			
COLOUR	Black			
ACCESSORIES	IEC Mains cable, Rubber Feet x 4, 1 label sticker sheet One 1 x 6 terminal socket for ES120/ ES 250			
APPROVALS	CE, IEC, RCM			

Due to continuous improvements, all specifications are subject to change



ENGINEERED BY AUSTRALIAN MONITOR

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