



## FBT AX 2000 series Power Amplifier Instruction Manual

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### FBT AX 2000 series Power Amplifier Instruction Manual



### WARNING

RISK OF ELECTRIC SHOCK DO NOT OPEN

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

RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

- WHERE MARKED, THIS SYMBOL INDICATES A DANGEROUS NONISOLATED VOLTAGE INSIDE THE LOUDSPEAKER: SUCH VOLTAGE COULD BE SUFFICIENT TO RESULT IN THE RISK OF ELECTRIC SHOCK.
- WHERE MARKED, THIS SYMBOL INDICATES IMPORTANT USAGE AND MAINTENANCE INSTRUCTIONS IN THE ENCLOSED DOCUMENTS. PLEASE REFER TO THE MANUAL.

## **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. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. 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.

THE DEVICE MUST BE CONNECTED TO THE MAINS THROUGH A POWER OUTLET WITH A PROTECTIVE EARTH CONNECTION.

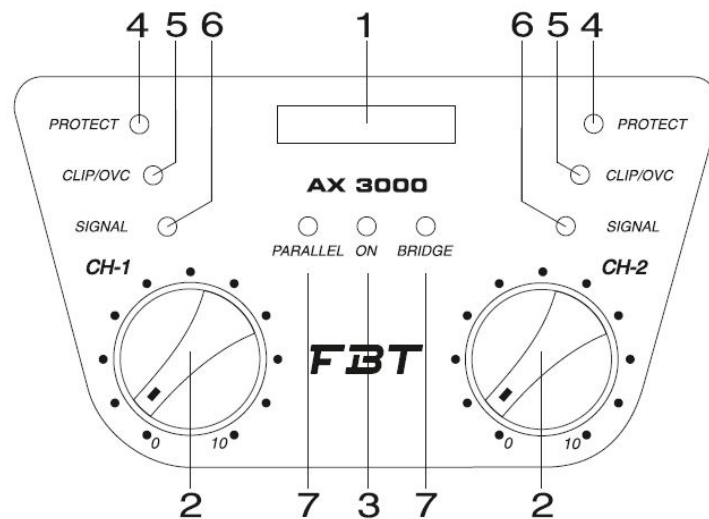
This device features a power outlet ; install the device so that the outlet for the power cord is easily accessible .

## **PRECAUTIONS**

- For proper air ventilation please make sure to leave sufficient clearance (min 11 Inc.) on all sides of the device.
- Please do not cover the ventilation slots with papers, table cloths, curtains, etc. in order not to prevent ventilation of the device.
- Please do not place any naked flame source, such as lighted candles, on the device.
- Please keep the device away from water springs and splashes and please do not place any objects containing liquids, such as vases, on the device.

- **CAUTION:** To avoid the risk of injuries please secure the device to the wall following the enclosed instructions.

## Front Panel



1. Amplifier power switch.
2. CH1/CH2/SUB BASS : Potentiometers signal level control. If the amplifier is operating in BRIDGE or PARALLEL mode, use CH1 control only.
3. The blue LED indicates the system is ON.
4. PROTECT: if this LED lights up, the protection system has activated due to overheating, overload or direct voltage on outputs. The protection activates to avoid damages to the power circuits, temporarily interrupting amplification until optimal conditions are restored.
5. CLIP/OVC: this LED lights up in case of short circuited line or when distortion reaches and exceeds 5%, indicating that the amplifier is reaching its maximum power; reduce signal level.
6. SIGNAL: indicates signal on input.
7. PARALLEL / BRIDGE : they indicate amplifier operating modes (see the "OPERATING MODES" chapter).

## Installation and Connections

Before connecting any other equipment, ensure that the amplifier is powered off and that the power supply data corresponds to the specifications on the rear panel of the power amplifier.

Make sure the volume controls are set to "0" to avoid possible damage to the loudspeakers. Also ensure that the operating mode selector is positioned as required: stereo, parallel or bridge.

**N.B. POWER OFF THE AMPLIFIER BEFORE CHANGING THE POSITION OF THE MODE SELECTOR.**

### Recommendations on input wiring

Please use only shielded cables for all input connections. If possible, please avoid using Unbalanced lines for professional equipment; if they cannot be avoided, please use the shortest cables possible. To reduce noise -e.g. hum and crosstalk- as much as possible, avoid laying excessively long low level input cables, as well as laying high level output cables and AC power supply cables in the same wireway. Should the same wireway be shared by all cables, use torqued cables (with 4 conductors) for low level signals. Before disconnecting the input cables or the connectors, turn the amplifier level controls to the minimum position.

### Recommendations on output wiring

In order to prevent short-circuits, please cover or isolate free cable or connector terminations. Never short-circuit

or connect amplifier output channels in parallel either with its own channels, or with those of other amplifiers.

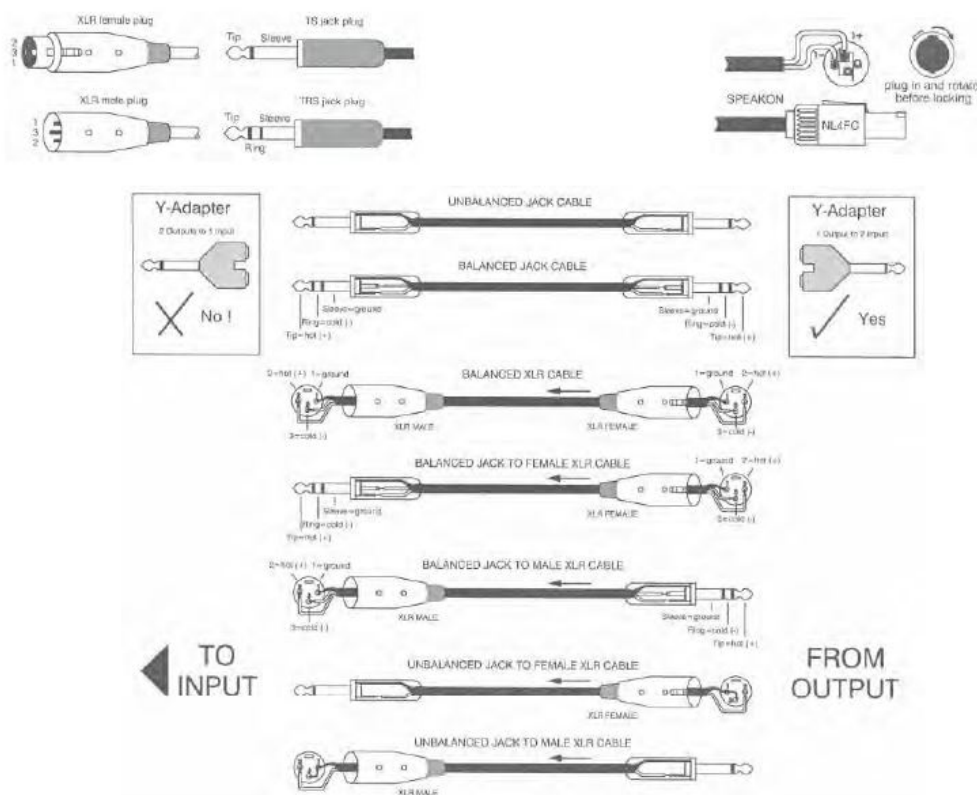
## Installation and Connections

“AX” amplifiers have been designed for rack mounting through the 4 fixing holes on the front panel. In case of fan cooling, make sure filters and/or front openings are clean and not clogged, and that (back or side) fan outlets are not blocked or covered by cables.

### OVERHEATING:

If the amplifier is overheating, check the following causes:

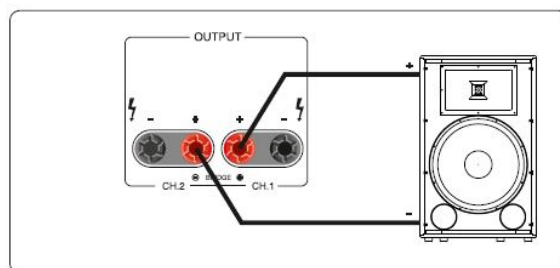
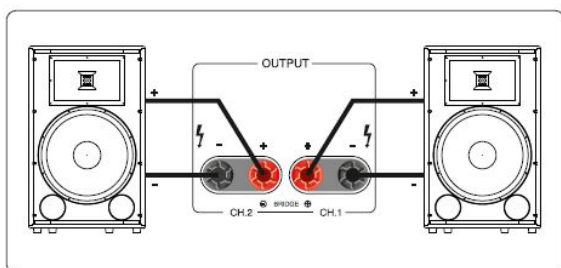
1. Insufficient airflow.
2. Input stage overload.
3. Too low impedance load.
4. High ambient temperature.



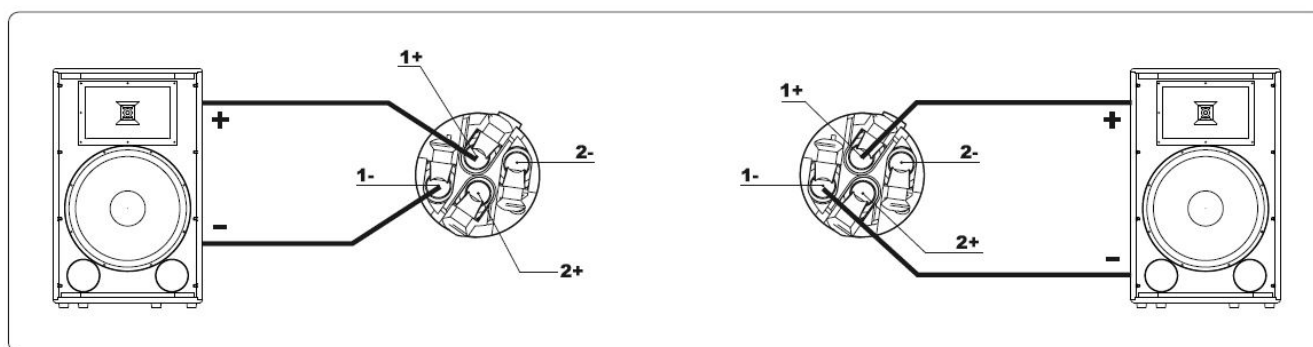
## Connection of output connectors

BINDING POST is a special type of electrical terminal often used as amplifier output connector or as loudspeaker input connector. Normally, binding posts are characterized by specific colors: black for ground connection; red for signal connection. With the amplifier set in STEREO mode, connect the positive (+) and negative (-) terminations of each loudspeaker to the output connectors of the relevant channel 1 or 2. With the amplifier set in BRIDGE-MONO mode, connect the load to the red binding post termination of each channel: do not use free binding posts if the amplifier is set to operate in bridge mode. The red binding post of channel 1 is positive (+); the red binding post of channel 2 is negative(-).

- Binding Post wiring in stereo mode
- Binding Post wiring in bridge mono mode

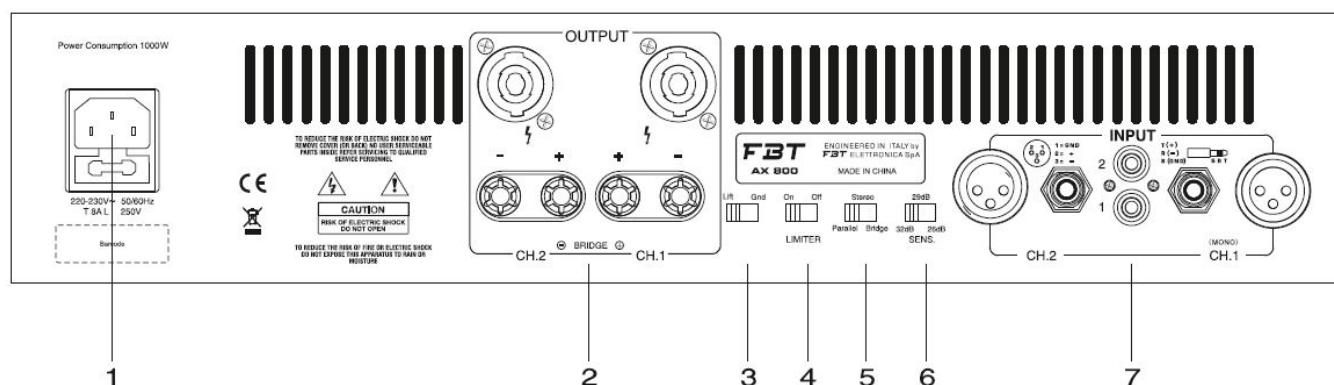


Speak on is a special multipolar connector developed by Neutral, for high power movable appliances. They allow a high quality and extremely reliable connection; they can control very high power levels and are characterized by a very long life. If the amplifier is set in STEREO mode (stereo configurations), connect the positive (+) and negative (-) terminations of each cable to the relevant connector of channel 1 or 2. With the amplifier set in BRIDGE mode (mono bridge configurations), connect the load between the positive (+) terminations of the connectors: In case of BRIDGE-MONO mode with non inverted output, CH 1 + is the positive (+) termination and CH2+ is the negative(-) one.



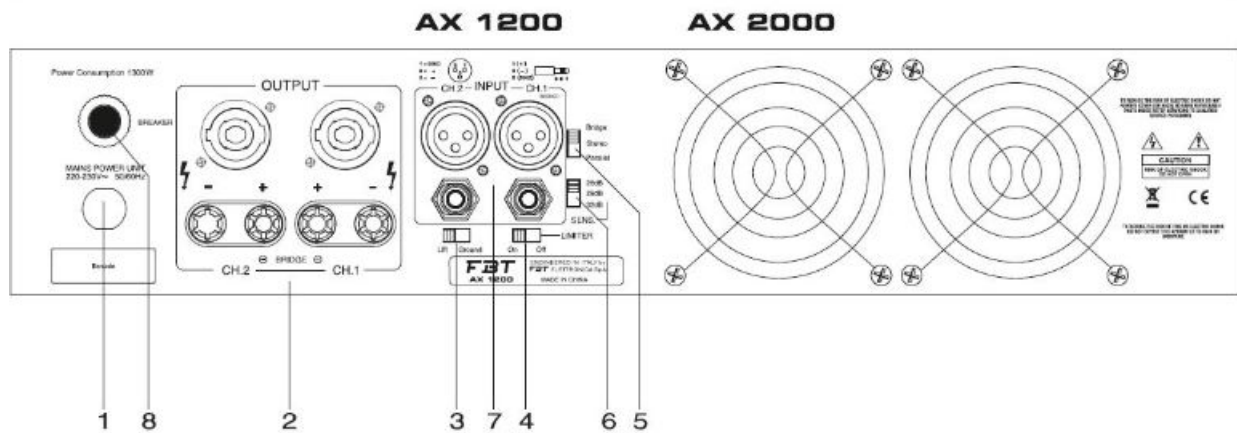
Speak on wiring in Stereo

## Rear Panel

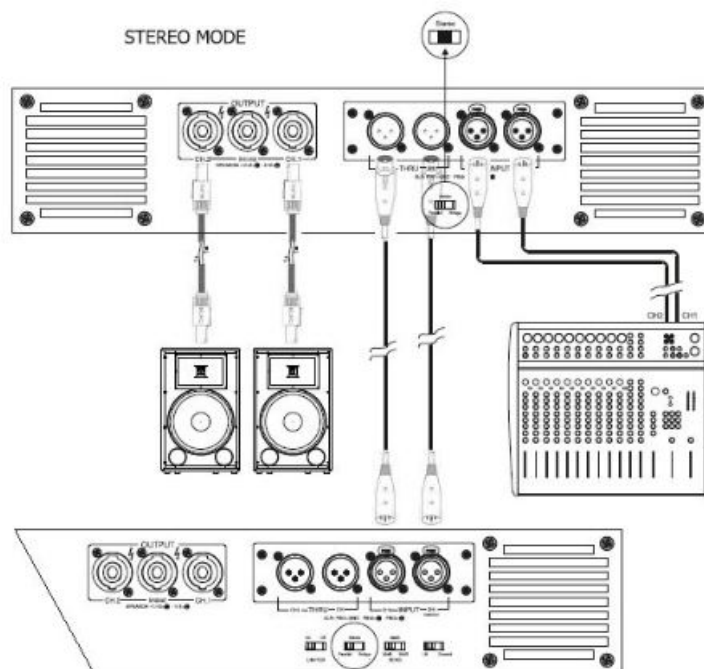


1. Socket for mains connection and housing of power circuit protection fuse. If the fuse breaks, it shall only be replaced by fuses with equal electrical features (8A-220/230V) (15A- 120V).
2. OUT. Output sockets with Speak on connectors and binding post terminals; they allow to connect sound speakers to the amplifier.
3. GROUND LIFT: This is a switch for the electric separation between the ground and earth circuits; it can be useful in order to remove the irritating noises (hum) caused by ground loops.
4. LIMITER: Switch for activating the Limiter, which fixes at 5% the maximum distortion value, thus protecting loudspeakers and improving listening quality at high volumes.
5. STEREO / PARALLEL/BRIDGE: Three-position operating switch (see "OPERATING MODES" chapter).

6. SENS: Three-step switch to adjust amplifier sensitivity according to the signal source.
7. INPUT: Jack and XLR input sockets; they are connected in parallel and, therefore, it is possible to use one as an input and the other one for drawing the signal to be transmitted to another amplifier. Inputs also include two cinch RCA sockets enabling the connection to a wide range of audio sources

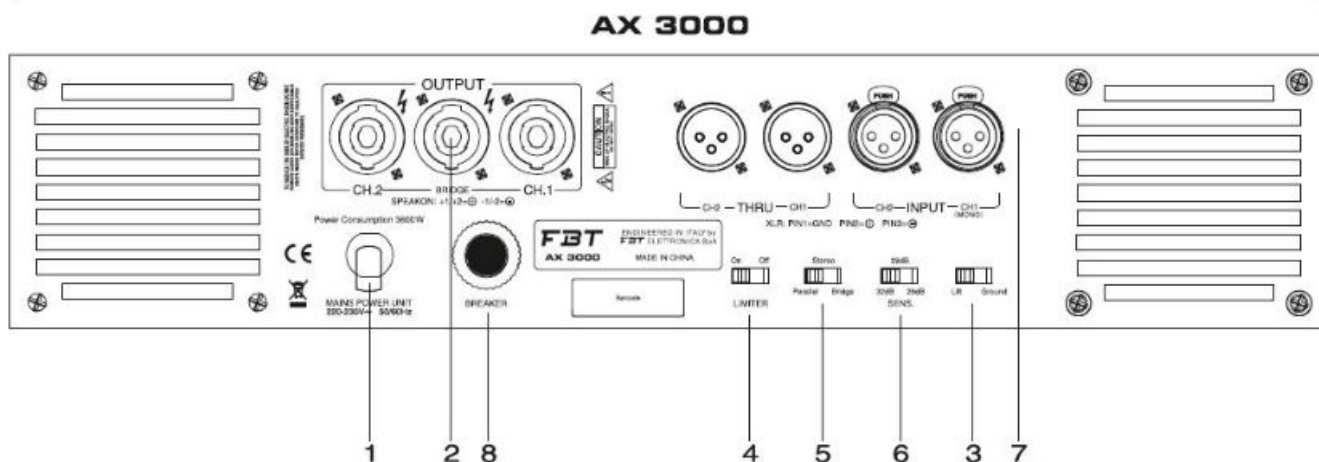


1. Cable for mains connection.
2. OUT. Output sockets with Speak on connectors and binding post terminals; they allow to connect sound speakers to the amplifier.
3. GROUND LIFT: This is a switch for the electric separation between the ground and earth circuits; it can be useful in order to remove the irritating noises (hum) caused by ground loops.
4. LIMITER: Switch for activating the Limiter, which fixes at 5% the maximum distortion value, thus protecting loudspeakers and improving listening quality at high volumes.
5. STEREO / PARALLEL/BRIDGE: Three-position operating switch (see “OPERATING MODES” chapter).
6. SENS: Three-step switch to adjust amplifier sensitivity according to the signal source.
7. INPUT: Jack and XLR input sockets; they are connected in parallel and, therefore, it is possible to use one as an input and the other one for drawing the signal to be transmitted to another amplifier.
8. BREAKER: Circuit breaker for the automatic disconnection of amplifier power supply in case of excessive current absorption. Wait a few minutes before restoring normal operation, then use the control again.



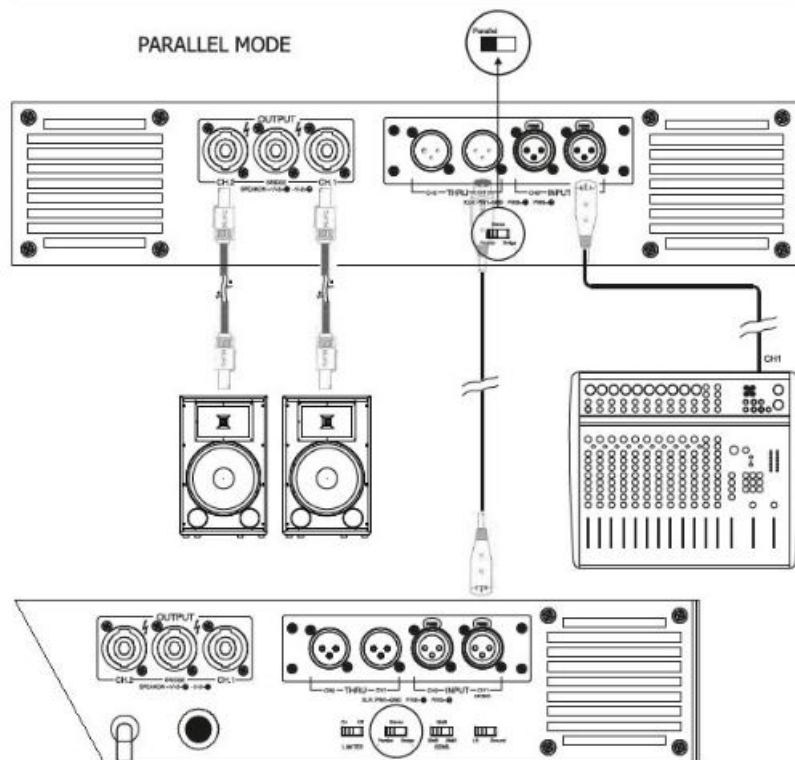
1. Cable OUT. for Output mains sockets connection. wit
2. OUT output sockets with Sallow speakers to to the connect amplifier. sound
3. itch GROUND for LIFT: the This electrics a separation between the ground and useful earth in order circuits; to it remove can thebe by irritating ground noises loops. (hum) caused
4. LIMITER: the Limiter, Switch which for actives fixes at 5% the maximum protecting distortion loudspeakers value, thousand high improving volumes. listening quality at
5. STEREO/PARALLEL/ BRIDGE: switch MODES” Three-position (see chapter). “OPERAT operating ING
6. SENS: Three-step switch to adjust amplifier sensitivity according to the signal
7. **INPUT:** XLR-F input sockets; they allow to connect the balanced signals coming from mixer outputs. THRU: two XLR-M sockets that can be used for drawing the signal to be transmitted to another amplifier.
8. **BREAKER:** Circuit breaker for the automatic disconnection of amplifier power supply in case of excessive current absorption. Wait a few minutes before restoring normal operation, then use the control

## Operating Modes

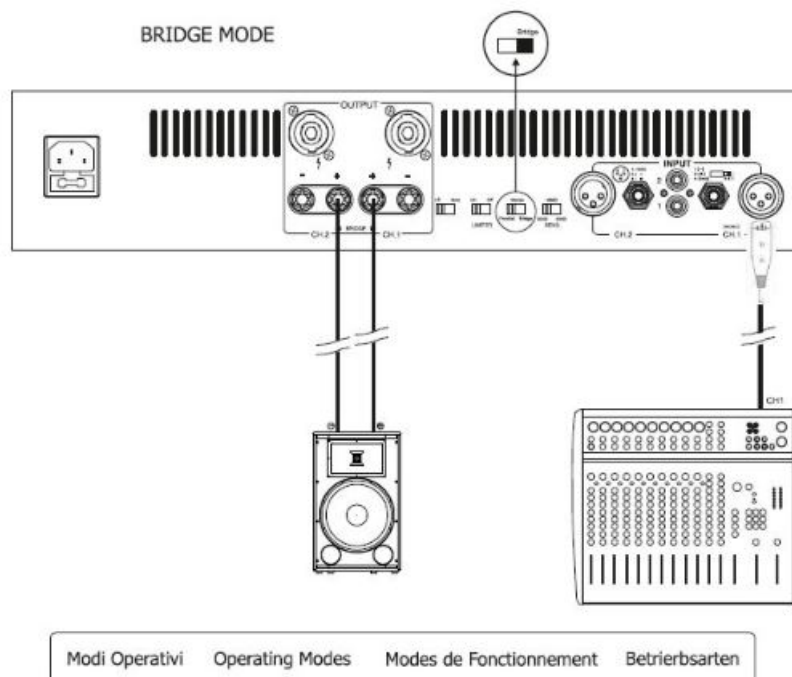


When the input signal is stereo, use STEREO mode, selectable on the rear panel. The left hand and right hand channel signals must be connected to the amplifier INPUT 1 and INPUT 2 respectively. The signal will be amplified in stereo and delivered to the OUT 1 and OUT 2 outputs; the left-right output balance can be set using the two

volume controls.

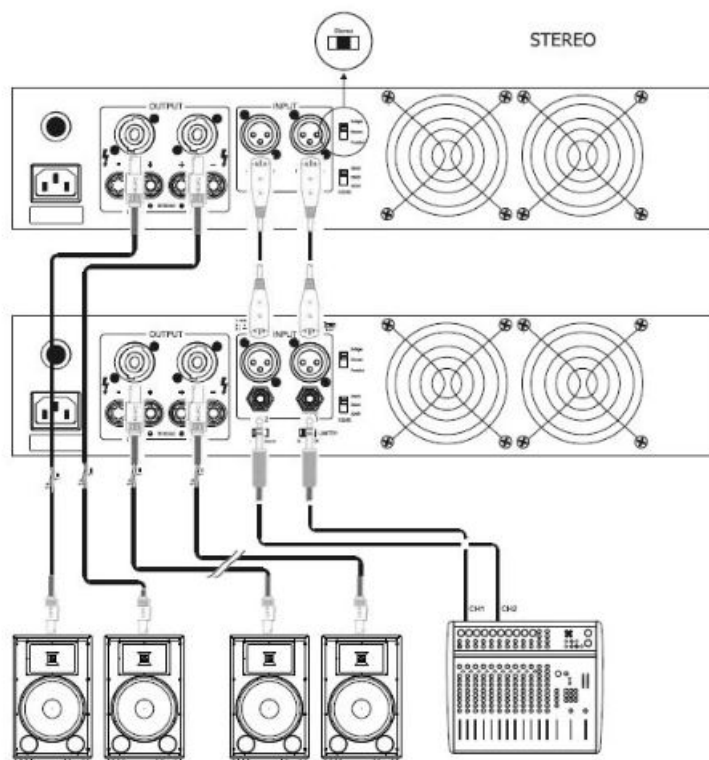


For mono input signals use PARALLEL mode, selectable on the rear panel. Mono signals should be connected exclusively to INPUT 1. The mono signal will be amplified by both channels and delivered to outputs OUT 1 and OUT 2 at a volume that can be set independently using the two volume controls



When a monophonic signal has to be amplified on a single output, the BRIDGE mode will allow to exploit all the power of internal final amplifiers. Connect the signal to amplifier INPUT 1 only. The mono signal will, thus, be transmitted to the output OUT BRIDGE, and it will be amplified with twice the power of normal connections.

**CAUTION:** always check the minimum impedance required by the OUT BRIDGE output (see the technical specifications).

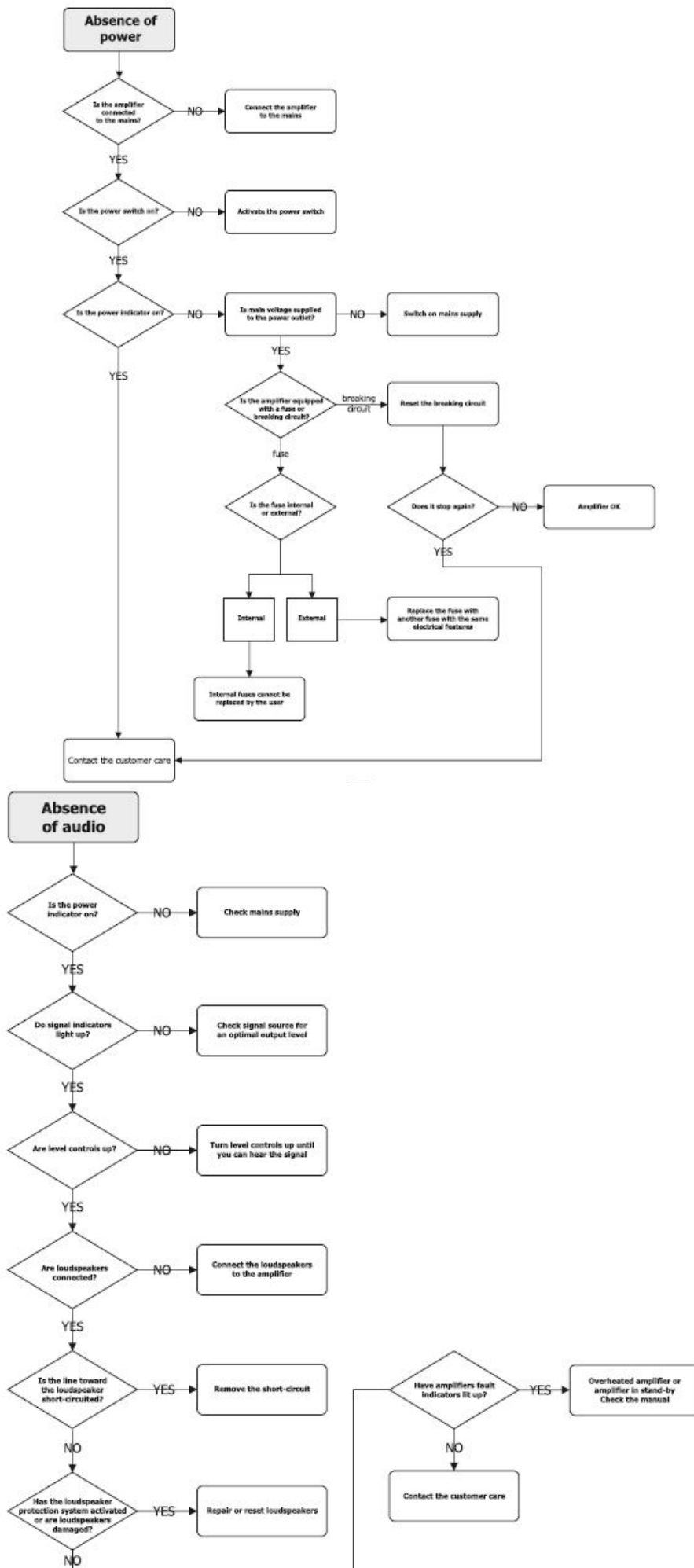


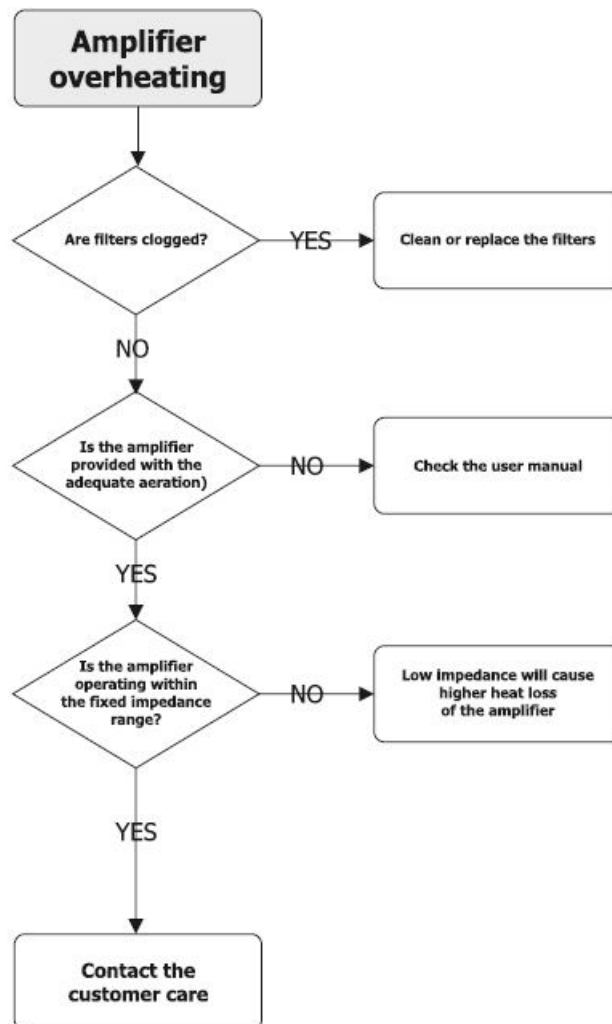
When a stereophonic signal has to be amplified on four loudspeakers, and high power is required, it is possible to use two amplifiers -even different set in STEREO mode; a “front/rear” amplification is this obtained on the four loudspeakers, enabling the individual control of each one of the four levels.

Power				AX800	AX 1200	AX 2000	AX 3000
Both channels driven Deux	Stereo 80hm	Continuous / Impulsive	1% TH D WR MS	230/250	340/350	630/650	880/950
Both channels driven Deux	Stereo 40hm	Continuous / Impulsive	1% TH D WR MS	350/400	460/600	840/1000	1300/1500
Bridge 8 Ohm		Continuous / Impulsive	WR MS	700/800	920/1200	1680/2000	2600/3000

Frequency response	@-1dB	20Hz-40k Hz	20Hz-40k Hz	20Hz-40k Hz	20Hz-40k Hz
Class		AB	H – 2 step	H – 2 step	H – 2 step
SIN Signal to noise ratio Rapport signal-bruit	<b>A</b> weight	> 100dB	> 100dB	> 100dB	> 100dB
THD	50 %  Pmax	< 0,03%	< 0,03%	< 0,03%	< 0,03%
Damping factor		> 400	> 400	> 400	> 230
Input impedance Impedance	Ohm	20k balanced	20k balanced	20k balanced	20k balanced
Protections		Short circuit  /  Thermal	Short circuit  /  Thermal	Short circuit  /  Thermal	Short circuit  /  Thermal
Power supply Alimentation		120 or 230 Vac 50/60Hz	120 or 230 Vac 50/60Hz	120 or 230 Vac 50/60Hz	120 or 230 Vac 50/60Hz

Power consumption Puissance		1000 W	1300W	2400W	3600W
		IN:	IN:	IN:	
Connectors		XLR/JACK OUT: SPE AKON/ BI NDING P OST	XLR/JACK OUT: SPE AKON/ BI NDING P OST	XLR/JACK OUT: SP EAKON / BINDING POST	IN: XLR O UT: SPEA KON
Dimensions	mm inc h	482x88x29 0 19"x3.5"x1 1.4"	482x88x36 7 19"x3.5"x1 4.4"	482x88x45 2 19"x3.5"x1 7.8"	482x88x45 8 19"x3.5"x1 8"
Net weight	kg lb	11 24.25	15 33	21 46.3	22 48.5





## Glossary

### Band-Pass

In a crossover, filter letting a band or frequency range pass, and cutting or rejecting the frequencies not included in this range.

### Low Pass Filter it

is a filter letting the frequencies below a certain threshold pass, and cutting the frequencies above such threshold.

### Class

Power amplifiers are mainly classified according to type of output stage. Such classification is based on how long output devices remain active during each cycle. The most common classes of sound amplifiers are: AB, AB+B, D, G,H.

### Fault

This word indicates any type of failure causing the stand-by or protection modes in an amplifier.

### Frequency Response

The frequency response is the actual frequency range a device can play, 5 Hz to 22 kHz for instance.

### 5/N ratio

Decibel ratio between signal and noise voltage. A high S/N ratio means low background noise, whereas a low S/N ration indicates high noise.

### THD (total harmonic distortion)

The ratio between the power of the fundamental tone at device output and the total power of all the harmonics in the frequency band at device output. THD is the sum of all the harmonics added by a device as the percentage of the measured signal level.

## HUM


A low pitch noise that may be listened as loudspeaker output; HUM is caused by wrong grounding, insufficient shielding or ground loops.

## WARNING

if the device is marked with this symbol it must not be disposed of along with normal domestic waste. It is electrical or electronic equipment that is required by law, in accordance with European Directives, to be disposed of separately. Proper disposal of these products will help ensure that the waste undergoes the necessary treatment, recovery and recycling and prevents the potentially negative impact on the environment as well as on human health that could derive from improper waste management.

All information included in this operating manual have been scrupulously controlled; however FBT is not responsible for eventual mistakes. FBT Electronica S.p.A. has the right to amend products and specifications without notice

## Documents / Resources

	<p><a href="#">FBT FBT AX 2000 series Power Amplifier</a> [pdf] Instruction Manual FBT AX 2000 Power Amplifier, FBT AX 2000, Power Amplifier, Amplifier</p>
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