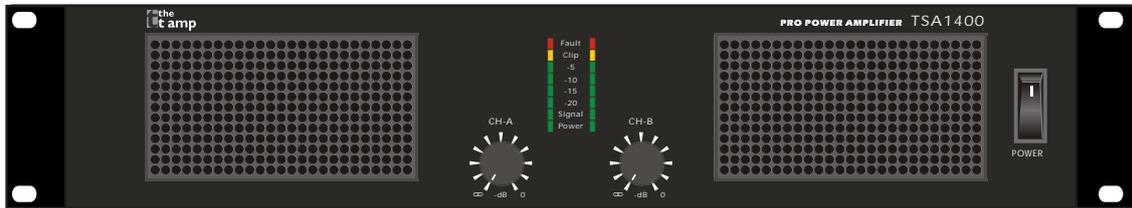
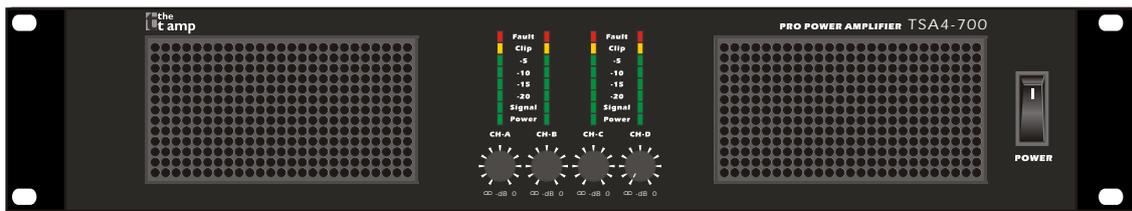




OWNER'S MANUAL



TSA4-700
TSA1400
TSA2200

PRECAUTIONS



WARNING

INSTALLATION

- Connect this unit's power cord only to an AC outlet of the type stated in this owner's Manual or as marked on the unit. Failure to do so is a fire and electrical shock hazard.
- Do not allow water to enter this unit or allow the unit to become wet. Fire or electrical shock may result.
- Do not place a container with liquid or small metal objects on top of this unit. Liquid or metal objects inside this unit are a fire and electrical shock hazard.
- Do not place heavy objects, including this unit, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.

Operation

- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- Do not remove the unit's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not modify the unit. Doing so is a fire and electrical shock hazard.
- If lightning begins to occur, turn off the power switch of the unit as soon as possible, and unplug the power cable plug from the electrical outlet.
- If there is a possibility of lightning, do not touch the power cable plug if it is still connected. Doing so may be an electrical shock hazard.

In case an abnormality occurs during operation

- If the power cord is damaged (i.e., cut or a bare wire is exposed), ask your dealer for a replacement. Using the unit with a damaged power cord is a fire and electrical shock hazard.
- Should this unit be dropped or the cabinet be damaged, turn the power switch off, remove the power plug from the AC outlet, and contact your dealer. If you continue using the unit without heeding this instruction, fire or electrical shock may result.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the unit, turn it off immediately. Remove the power cord from the AC outlet. Consult your dealer for repair. Using the unit in this condition is a fire and electrical shock hazard.



CAUTION

Installation

- Keep this unit away from the following locations:
 - Locations exposed to oil splashes or steam, such as near cooking stoves, humidifiers, etc.
 - Unstable surfaces, such as a wobbly table or slope.
 - Locations subject to excessive heat, such as inside a car with all the windows Closed, or places that receive direct sunlight.
 - Locations subject to excessive humidity or or dust accumulation.
- Do not place the power cord close to a heater. It may melt, causing fire or electrical shock.
- Hold the power cord plug when disconnecting it from an AC outlet. Never pull the cord. A damaged power cord is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- This unit has ventilation holes at the front and rear to prevent the internal temperature rising too high. Do not block them. Blocked ventilation holes are a fire hazard.

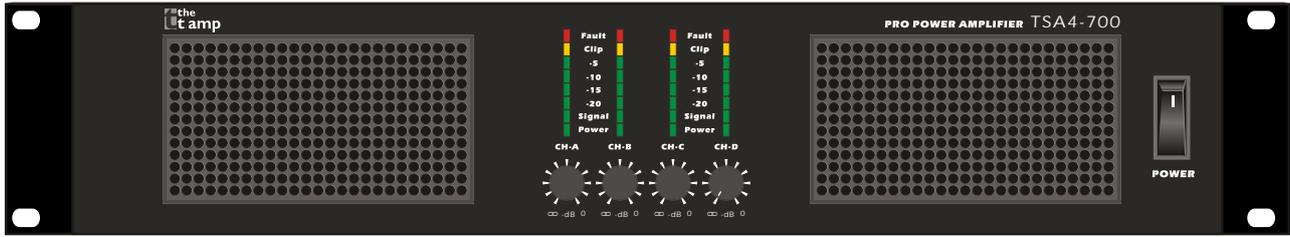
In particular, do not

- place the unit on its side or upside down,
 - place the unit in any poorly-ventilated location such as a bookcase or closet (other than on the dedicated rack),
 - cover the unit with a table cloth or place it on a carper or bed.
- Allow enough free space around the unit for normal ventilation. This should be: 5cm at the sides, 10cm behind, and 10cm above.
If the airflow is not adequate, the unit will heat up inside and may cause a fire.
 - To relocate the unit, turn the power switch off, remove the power plug from the AC outlet, and remove all connecting cables. Damaged cables may cause fire or electrical shock.

Operation

- Use only speaker cables when connecting speakers to amplifier outputs. Using other types of cables is a fire hazard.
- Turn off all musical instruments, audion equipment, and speakers when connecting to this unit. Use the correct connecting cables and connect as specified.
- Always lower the volume control to minimum before turning on the power to this unit. A sudden blast of sound may damage your hearing.
- Do not use this amplifier for any purpose other than driving loud-speakers.
- If you know you will not use this unit for a long period of time, such as when going on vacation, remove the power plug from the AC outlet. Leaving it connected is a potential fire hazard.

Front Panel



Power switch

Press to toggle the power on or off.



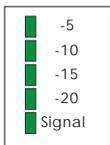
Fault LED

Lights up red to indicate that protection is in effect. Specifically, lights up if the heat sink overheats, or if a DC voltage is detected at the amplifier outputs. Also lights up for about Three seconds at time of power-on, as the amp gets ready to operate. To provide protection, the unit will not output any sound from the speakers while this indicator is lit up. When Start-up is completed or the problem is corrected, the indicator goes off and normal operation resumes.



Clip LED

Lights up orange when the output signal distortion on the corresponding channel rises above 1% -indicating that "clipping" has occurred because the signal level is too high.



Signal LED

Normal indication: The Signal indicator illuminates when the input signal exceeds -35dB, -20dB indicator illuminates when the signal exceeds -20dB, the -15dB indicator illuminates when the signal exceeds -15dB, the -10dB indicator illuminates when the signal exceeds -10dB, the -5dB indicator illuminates when the when the signal exceeds -5dB.

If no indication: check gain settings and increase gain if necessary. Check input connections and audio source for signal. If the Clip LED illuminates with little or no Signal Indication, check the output wiring for shorts.

Abnormal indication: if Signal, -20dB, -15dB, -10dB, -5dB LED illuminates with no signal input, there may be system oscillations or some other malfunction. Disconnect the load and fully reduce the gain. If the LED remains on, the amp may need servicing.



Power LED

Normal indication: AC switch ON, LED will illuminate.

If no indication: Check AC outlet.

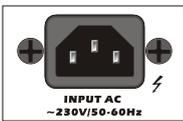
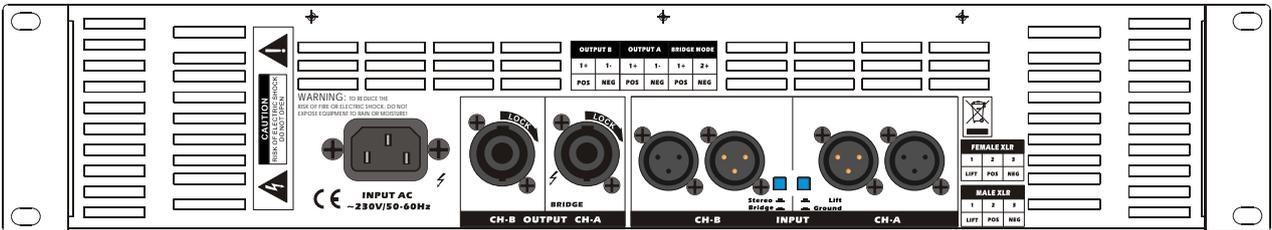
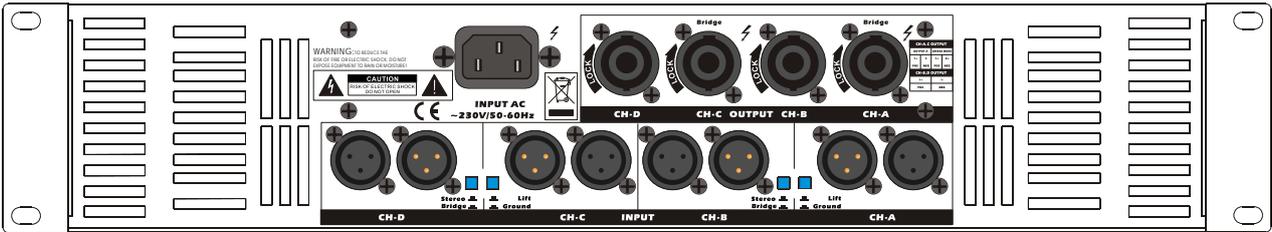
Gain Controls



Turn the gain controls clockwise to increase gain and counter clockwise to decrease gain. The maximum voltage gain of the amplifier varies depending on the model is shown of the designation.

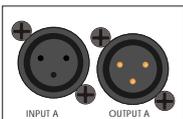
The Gain controls are marked in dB of attenuation. There are 21 detents for repeatable adjustments. The upper 14 steps are about 1dB each, and settings should normally be made within this range. The range below -14 dB should not be used for normal program levels, as the input headroom could be exceeded, but can be used for testing at reduced levels. At the minimum setting, the signal is completely cut off.

Rear panel



Mains Socket

Please, make sure to check whether the voltage selector shows the correct mains voltage that matches the local mains supply at the installation site. An appropriate mains cord is included in the package.



Input

The inputs INPUT A & INPUT B are connect to mixing consoles. The XLR-type connecting OUTPUT A & OUTPUT B are prepared for through-connecting input signals to additional external power amp s. The input signal is directly routed to these output connectors. Accordingly, input and output connectors of the corresponding channel are interconnected in parallel, offering permanent electrical connection, without regard to the setting of the Power-ON switch.

Although having XLR-type output connectors, some mixing console models provide unbalanced output connection only. when using mixers with unbalanced outputs, bridging PIN1 and PIN3 of the power amp s input connectors or leaving PIN3 of the cable s plugs unconnected is necessary. Otherwise, when feeding in unbalanced audio signals via PIN3 (B, -, cold) and PIN2 (A, +, hot), strange humming and HF-interference may occur, which very likely will damage the power amplifier and /or the connected speaker cabinets.

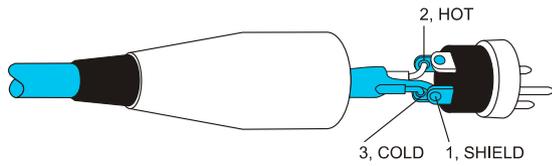
Rear panel

LF- connection cords

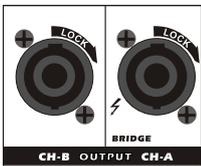
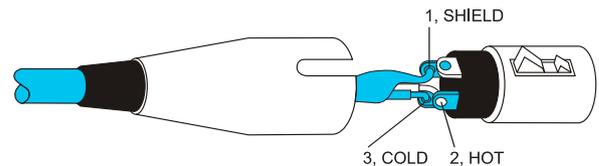
Choosing high-quality balanced cables(two conductors for the audio signal plus separate shielding mesh) with XLR-type connectors is recommended for LF-signal connection. Although connecting unbalanced cables to the power amplifier inputs is possible as well, using balanced cables is always preferable. A great number of today's audio appliances employ balanced outputs. With balanced cabling, the shield connects all metal enclosure parts and therefore efficiently eliminates the introduction of external interference-mostly noise and hum.

XLR-type connector pin-assignment

XLR (male)

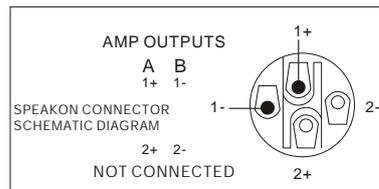


XLR (female)



Output Connectors

Power amp has two output channels. Channel A and Channel B is provided via which SPEAKON-type output connectors.



Selecting Stereo / Parallel / Bridge Mode

Stereo Mode

Each channel within the pair remains independent, and each may be used for a different signal.

Parallel Mode

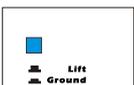
This setting connects both inputs of a pair together. One signal feeds both channels. Do not connect different sources to each input. Each channel's gain control and speaker connection remain independent.

Bridge Mode

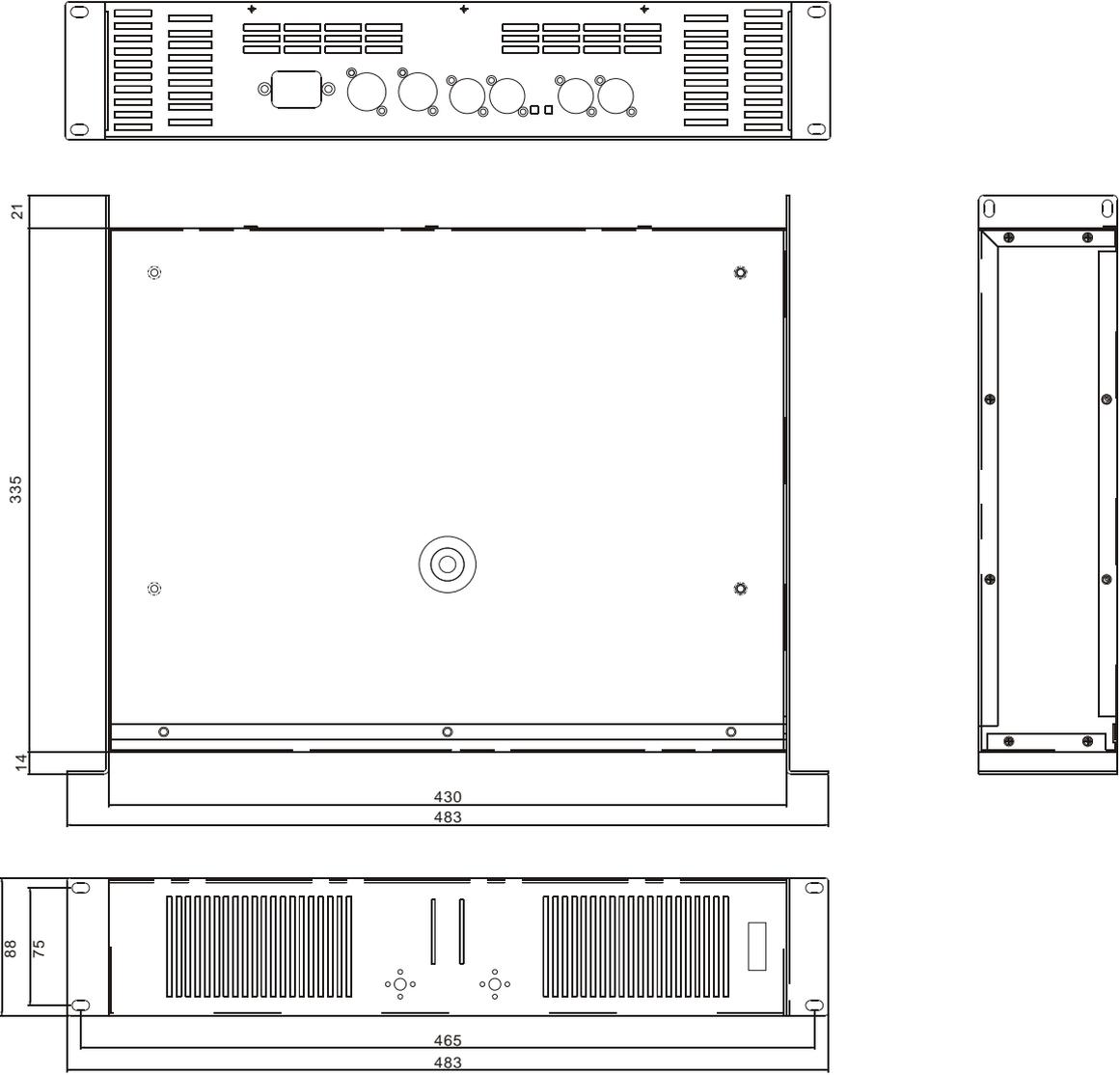
This setting combines both channels of a pair into a single channel with twice the output voltage. Use only the first channel's input and gain control. Set the second channel's gain control at minimum.



Selecting Ground Switch



Dimensions



Unit: mm

Current Draw Table (in Amperes)

Model	Load	1/8 Power (pink noise)	1/3 Power (pink noise)	Full Power (sine)
TSA1400	(2x)8 Ohms	1.93A/330W	4.4A/734W	7.74A/1400W
	(2x)4 Ohms	2.86A/480W	6.9A/1200W	12.2A/2300W
	(2x)2 Ohms	4.1A/700W	7.2A/1313W	17.3A/3345W
	8 Ohms bridged	3.0A/500W	6.9A/1200W	12.4A/2300W
	4 Ohms bridged	5.4A/984W	14.2A/2690W	17.2A/3310W
TSA2200	(2x)8 Ohms	1.69A/260W	2.73A/400W	9.5A/1700W
	(2x)4 Ohms	4.0A/680W	6.5A/1180W	14.97A/2800W
	(2x)2 Ohms	5.0A/850W	9.8A/1800W	21A/4200W
	8 Ohms bridged	4.1A/680W	6.8A/1200W	15.2A/2850W
	4 Ohms bridged	4.5A/820W	10.1A/1900W	23A/4600W
TSA4-700	(4x)8 Ohms	3.1A/400W	5.8A/860W	9.5A/1400W
	(4x)4 Ohms	4.4A/650W	9.8A/1500W	15.4A/2450W
	(4x)2 Ohms	6.4A/950W	11.6A/1800W	20A/3100W
	(2x)8 Ohms bridged	4.3A/620W	15A/2450W	15A/2450W
	(2x)4 Ohms bridged	6.1A/870W	19.5A/3300W	19.5A/3300W

This table provides typical current draw for each model as a function of load output power level. Units of measurement are Amperes r.m.s.

NOTE! Current draw shown is under 220V. For 230V models, multiply values shown by 0.96; For 120V models, multiply values shown by 1.83; For 100V models, multiply values shown by 2.2 .



- 1/8 power (pink noise) represents typical program with occasional clipping. Use this rating for most applications.
- 1/3 power (pink noise) represents severe program with heavy clipping.
- Full power (sine) is continuous sine wave driven at 1% clipping.

Specifications

Model	TSA1400			TSA2200			TSA4-700		
Load Impedance	8ohm	4ohm	2ohm	8ohm	4ohm	2ohm	8ohm	4ohm	2ohm
Rated output power (THD=1%,1kHz)	2X450W	2X670W	2X800W	2X590W	2X910W	2X1200W	4X490W	4X810W	4X930W
Maximum bridged output power (THD=1%,1kHz)	1380W	1600W		1800W	2400W		2X1600W	2X1800W	
Maximum RMS voltage swing (THD=1%,1kHz)	60V			68.7V			62.6V		
Slew rate (at 1kHz)	35V/us			41V/us			38V/us		
Power consumption (at 1/8 maximum output power, lim. pink)	330W	430W	700W	260W	680W	850W	400W	650W	950W
Input sensitivity (at rated output power or voltage,1kHz)	1V			1V			1V		
THD at rated output power	<0.1%			<0.1%			<0.1%		
IMD-SMPTE (60Hz,7kHz)	<0.1%			<0.1%			<0.1%		
DIM30 (3.15kHz,15kHz)	<0.1%			<0.1%			<0.1%		
Crosstalk (ref.1kHz, at 10% rated output power)	<-70dB			<-70dB			<-70dB		
Frequency response (ref.1kHz)	20Hz...20kHz (0~2dB)			20Hz...20kHz (0~2dB)			20Hz...20kHz (0~2dB)		
Input impedance (20Hz...20kHz,balanced)	20k ohms / balanced, 10k ohms unbalanced			20k ohms / balanced, 10k ohms unbalanced			20k ohms / balanced, 10k ohms unbalanced		
Damping factor (at 100Hz/1kHz 8 Ω)	>400			>400			>400		
Signal to noise ratio (A weighted)	105dB			105dB			105dB		
Power requirements				AC~230V 50Hz-60Hz					
Protection	Audio limiters, high temperature, short circuit								
Cooling	Front-to-rear								
Dimensions (W x D x H)	483x350x88mm			483x350x88mm			483x350x88mm		
Net weight	11.5kg			11.5kg			11.5kg		
Gross weight	14kg			14kg			14kg		

Please note: Every information is subject to change without prior notice.



Disposal

Do not dispose of the device at the end of his operating life in your normal domestic waste. This device is subject to the European Guidelines 2002/96/EC.



Have the product disposed of by a professional disposal company or by your communal disposal facility. Observe the currently applicable regulations. In case of doubt contact your disposal facility. Dispose of packaging materials in an environmentally responsible manner.

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