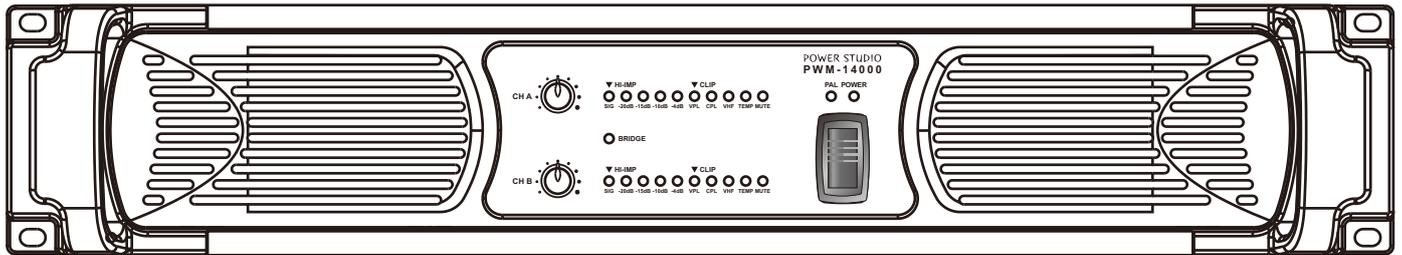


User Instructions >>>

This booklet contains important information concerning the proper and safe operation of your new amplifier..

AMPLIFIER | PWM-14000

Made in Taiwan



Index

- 01 Precautions
- 02 Introduction
- 03 Front Panel
- 04 Rear Panel
- 05 Operation and Performance

POWER STUDIO

PROFESSIONAL POWER AMPLIFIER

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance



CAUTION: To reduce the risk of electrical shock, do not remove the cover (or back). No user serviceable parts inside; refer servicing to qualified personnel.

WARNING: To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

Important Precautions

- To reduce the risk of electrical shock or fire, do not expose this unit in rain or moisture.
- Make sure that the AC Mains voltage is correct and matches the voltage printed on the rear panel of the amplifier (110 V or 220V)
- Do not spill water or other liquids into or on to your unit.
- Do not attempt to operate this unit if the power cord has been frayed or broken.
- Do not attempt to remove or break off the ground prong from the electrical cord. This prong is used to reduce the risk of electrical shock and fire in case of an internal short.
- Disconnect mains power before making any type of connection.
- Do not remove the cover under any conditions. There are no user serviceable parts inside.
- Never plug this unit in to a dimmer pack.
- Always be sure to mount this unit in an area that will allow proper ventilation. Allow about 6" (15cm) between this device and wall.
- Do not attempt to operate this unit if it becomes damaged.
- This unit is intended for indoor use only, use of this product outdoors voids all warranties.
- During long periods of non-use, disconnect the unit's mains power.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

- Always mount this unit in a safe and stable manner.
- Power cords should be routed so they are not likely to be walked on, pinched by items placed upon or against them.
- Cleaning -The outside of the unit should be wipe down with a soft cloth and mild cleaner when needed.
- Heat -The amplifier should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
- The fixture should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged.
 - B. Objects have fallen, or liquid has been spilled into the unit.
 - C. The appliance has been exposed to rain or water.
 - D. The fixture does not appear to operate normally or exhibits a marked change in performance.

Introduction

Congratulations and thank you for purchasing PWM-14000 amplifier. This amplifier is a representation of PowerStudio's continuing commitment to produce the best and highest quality audio products at an affordable price. This amplifier is designed to provide a big impact in sound reproduction. Please read and understand this manual completely before attempting to operate your new amplifier. This booklet contains important information concerning the proper and safe operation of your new amplifier.

Unpacking: Every PWM-14000 amplifier has been thoroughly tested and has been shipped in perfect operating condition. Carefully check the shipping carton for damage that may have occurred during shipping. If the carton appears to be damaged, carefully inspect your unit for any damage and be sure all accessories necessary to operate the system have arrived intact. In the event damage has been found or parts are missing, please contact your dealer for further instructions.

Installation: This amplifier is designed to mount into a standard 19" rack. The front panel provides four holes used to screw the unit into a rack. The unit also provides a way to rear mount the unit into a rack for added security. Rear mounting the unit is especially recommended if the unit is to mount into a mobile rack.

AMPLIFIER | PWM-14000

Precautions | Introduction | **Front Panel** | Rear Panel | Operation and Performance

Front Panel Control

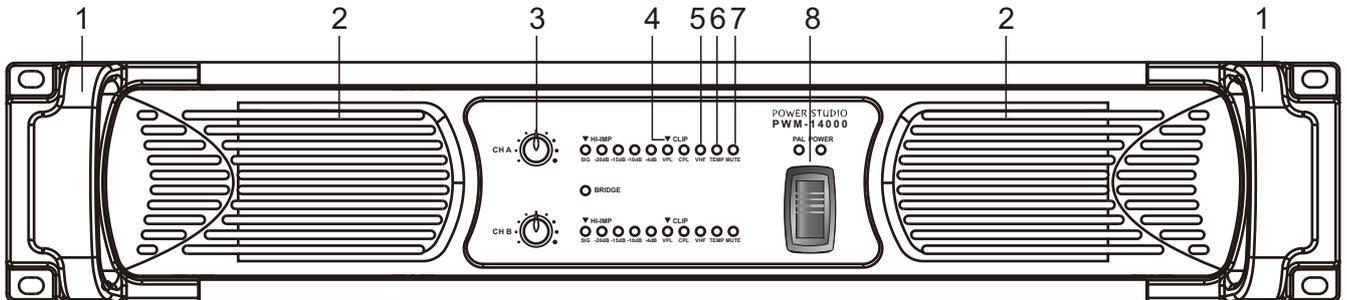


Figure 1



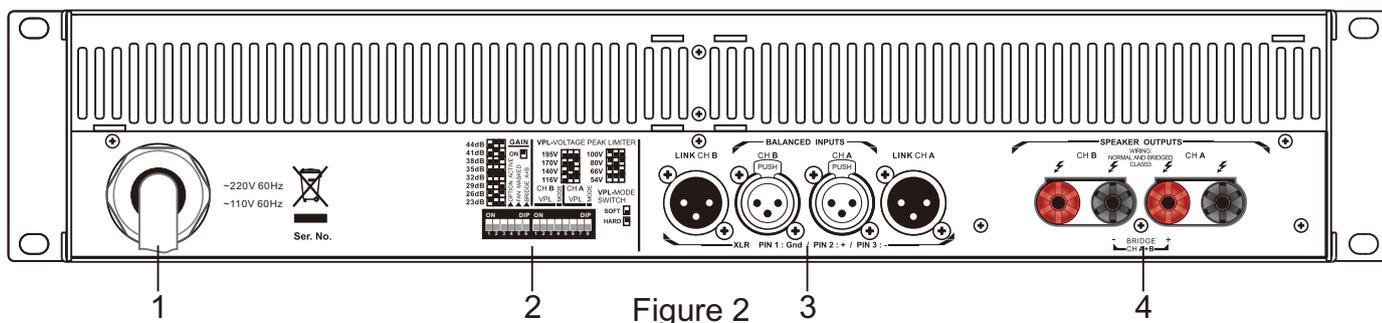
Figure 1 A

- 1. Carry/protection handle** - Both handles can be used to carry the amplifier, they also act as protection for the front panel.
- 2. Front panel fan grill & filters** - Detachable snap-in front panel design for the ease of dust filters replacement (as Figure 1A), foam filters are located behind the front panel to prevent dust entering the amplifier.
- 3. Input level attenuators** - These controls are used to alter the signal level entering the amplifier. They are calibrated to help set up active loudspeaker systems or cut down unwanted noise from the input signal.
- 4. Clip/limit indicator** - This indicator tells when the amplifier output is clipping or limiting. The two different states can be told apart:
 - When the clip limiter is engaged it flickers briefly.
 - When the clip limiter is not engaged it lights for a longer period.
- 5. VHF protect indicator** - This indicator lights when constant signals, above 12KHz at full power, are present at the output terminals. When this happens the input signal is muted and the process cycles until the VHF signal is no longer present.
- 6. Over temperature protect indicator** - This indicator lights if the amplifier tries to operate above its maximum operating temperature (90°C). The indicator first comes on as a warning to either turn down the input level or check the cooling arrangements after which point the amplifier will mute the input signal. When the cooling fans have returned the output heatsinks to the normal operating temperature the input signal is unmuted.
- 7. Mute indicator** - This indicator will light when if a fault condition on the channel. The possible conditions may be due to overload, overheat, CPL and VHF protection.
- 8. AC Power switch** - This is used to activate the amplifier.

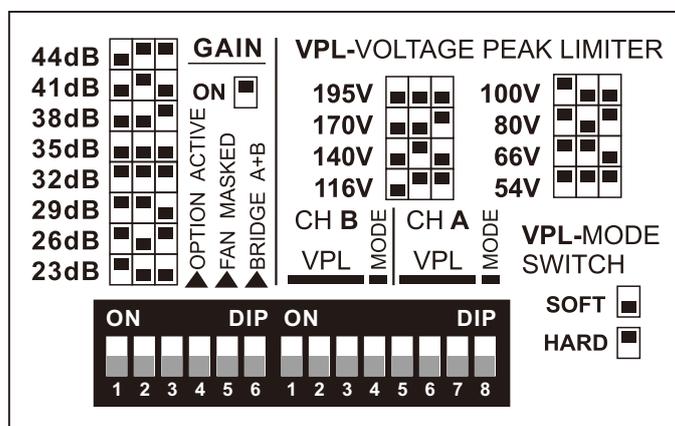
AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | **Rear Panel** | Operation and Performance

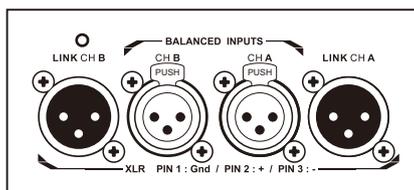
Rear Panel Control



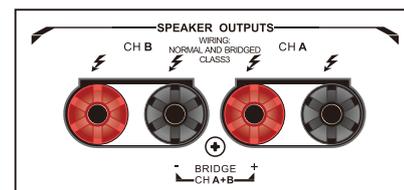
- AC line cord** - Mains input 110V or 220V operation (Not selectable)
- The DIP - switch features** - The following features may be adjusted using the DIP-switches on the rear panel of the amplifier.
 - Gain** - Globally set for all channels, from +23dB to +44dB in 3dB steps.
 - Option active** - Not currently implemented.
 - Fan Masked** - When on, engages the intelligent fan feature; fan speed is lowered when no signal is present.
 - Bridge A+B** - Switches the channel pairs into bridge mode operation, an automatic -6dB gain compensation is applied.
 - VPL** - The Voltage Peak Limiter provides optimum peak voltage settings for each channel. Level selections vary by model within the PWM-14000 amplifier.
 - Mode** - Select VPL mode to either Hard or Soft operation. For channels driving sub-woofers and low-frequency drivers, it is recommended to use the Hard setting for optimal operation. For mid-and-high-frequency drivers, always select Soft.



3. Input connectors - This amplifier is equipped with XLR-F input connector, two-channel models also offer parallel ("loop-thru") XLR-M output connectors for daisy-chaining multiple amplifiers from the same signal source.



Audio inputs and loop-thru connectors-tow-channel models



Binding Posts-two-channel models

4. Output connectors - PWM-14000 offered with Binding Post connectors for speaker output connection.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Operation and Performance

Signal flow blocks

The PWM Series amplifier has the same signal flow, and the same feature sets. The only internal differences are in the maximum output current per channel and VPL settings.

The input stage of PWM Series amplifier has a high sensitivity to provide ample system headroom. This in effect means that the input stage is almost impossible to clip.

Overall amplifier input gain is adjusted using the input stage DIP-switches. Please note that the gain setting is global, affecting all channels. Following the input stage, the dedicated level control on each channel allows signal attenuation from 0 dB to minus.

The Current Peak Limiter (CPL) section dynamically limits the input signal based on three parameters: sensed current level, feedback from the output stage, and sensed voltage clip from the VPL (and output amplifier voltage clip if “Soft Clip” is activated). This ensures that power output is maintained within the design limits of the amplifier.

The adjustable Voltage Peak Limiter (VPL) sets the maximum output voltage and therefore also the maximum output power. Eight different voltage stages are available using the DIP-switches on the rear panel.

The sophisticated output section monitors faults and generates appropriate warnings, which are displayed on the amplifier front panel. These alerts allow the operator to adjust system settings and thereby avoid problems. In the rare event that conditions are extraordinarily severe, the amplifier will shut down until the fault or problem setting has been rectified or adjusted. These sensing circuits are also employed to feed back voltage and current level information, via a side chain, to the limiters. Sensing circuit also transmit local amplifier module temperature and power supply temperature to the appropriate protection mechanisms. Read the Protection, Faults and Warnings section for further details.

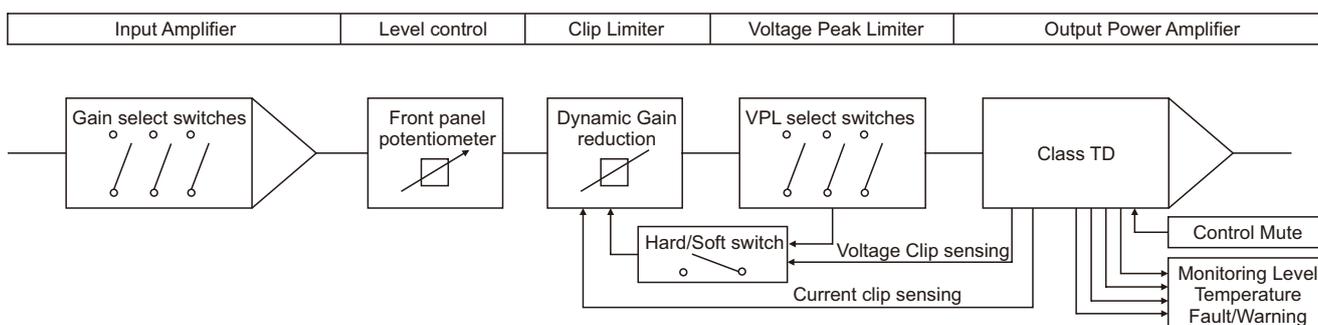


Figure 3
PWM-14000 signal flow

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Headroom, Sensitivity and VPL/Gain settings

The input amplifier and limiter system is designed to accommodate extremes of performance. Typically, exceeding maximum input by much as +10dB will only result in a 1% increase in distortion. The following schematics illustrate how the adjustable VPL and Gain circuitry affect input sensitivity and output power.

The tables of the figure 4 showed input sensitivity for PWM-14000 with 2 ohm load and 195V peak (max.) and 54V peak (min.) respectively for the eight different gain stages between +23dB and +44dB. The resulting output power is displayed in dBu, Vrms and Watts in the tables to the far right.

The headroom available through the input stage to the clip limiter is shown by the dotted lines as +10dB at 195V peak and +16.1dB at 54V peak. These lines illustrate the additional signal level that can be accepted at the input before any significant distortion will appear at the input stage.



If you use the level potentiometer in the signal chain to reduce the level by an amount greater than the headroom relative to input sensitivity, AND you drive the amplifier to clip level, you are in danger of clipping the input stage before the current or voltage peak limiters are activated.



When bridging two channels, you must add +6dB to the input sensitivity to achieve maximum output voltage due to the automatic -6dB gain compensation inserted by the amplifier.

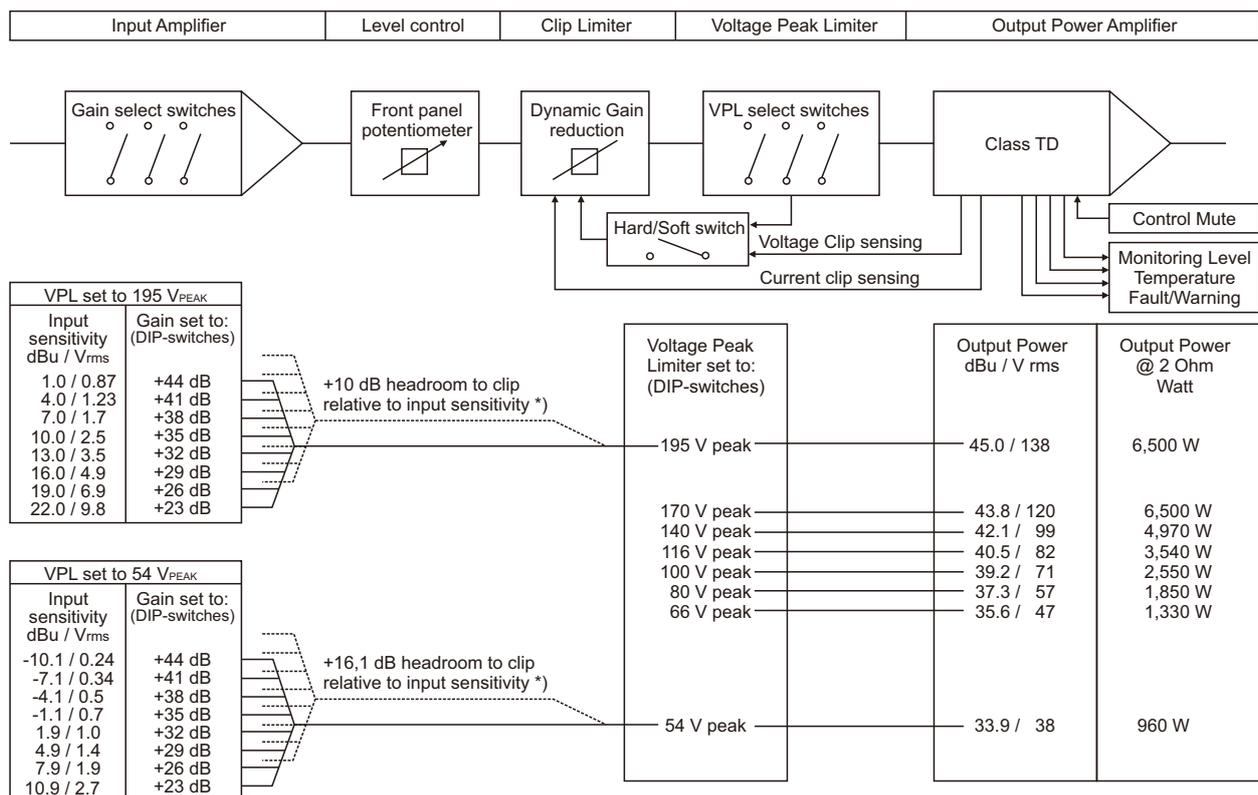


Figure 4

PWM-14000 VPL and GAIN settings

*) Headrom limited to +5dB at Gain set to +23dB at Max. VPL

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Audio Input and Output connections Balanced Input connections

The XLR input connectors are electronically balanced, and wired according to the IEC268 standard (pin2 = hot). XLR input connector should be wired as follows:

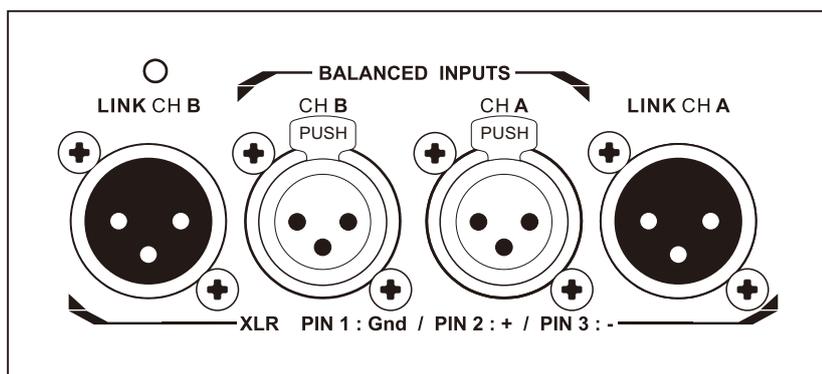


Figure 5
Audio inputs and loop-thru

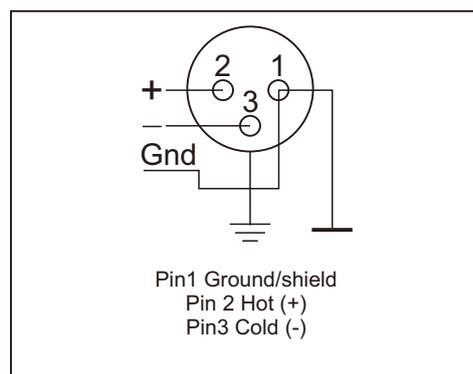


Figure 6
Balanced XLR wiring schematic



When linking the same source signal to several input channels, be aware that there is a limit to the number of channels an output source can “drive”. A typical output source (e.g. a DSP crossover unit) can drive up to four amplifier channels before external line-drivers might be required to buffer the signal.

Unbalanced Input connections

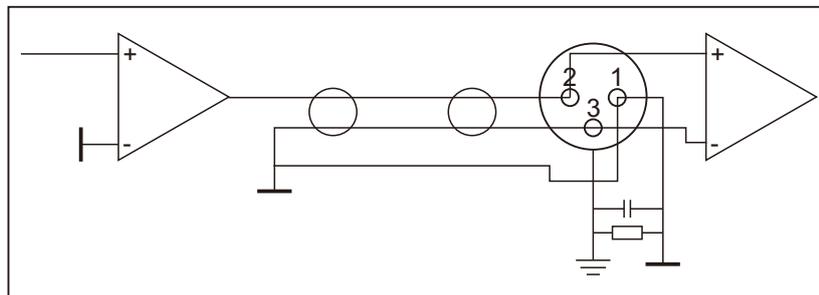


Figure 7
Unbalanced XLR wiring schematic

To connect an input to an unbalanced source, it is possible to connect pins 1 and 3 in the XLR plug at the amplifier end of the cable. However, a better method is to connect pin 3 to the shield at the source end of the cable, as this usually results in better hum and noise rejection. Balanced input connections are recommended whenever possible.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Binding Post (BP) Output connectors

Refer to the instructions in this section if your amplifier is equipped with Binding Post output connectors.

Connect the positive (+) loudspeaker cable to the positive (+) red terminals. Connect the negative (-) loudspeaker cable to the negative (-) black terminals. For bridge mode, connect the positive (+) terminal on Channel A to the positive (+) loudspeaker cable and the negative (-) terminal on Channel B to the negative (-) loudspeaker cable.

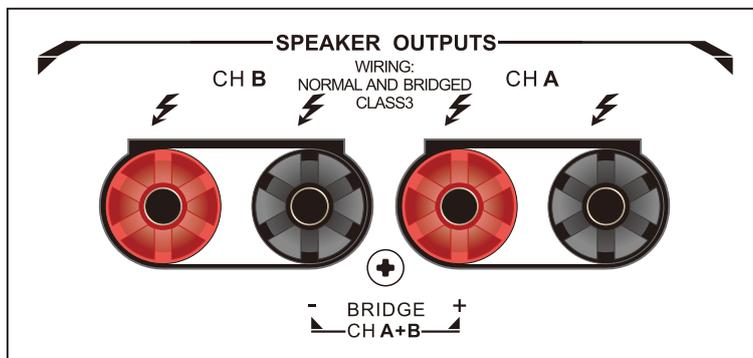


Figure 8
Binding Post outputs



The outputs on The PWM-14000 amplifier produce high voltage. Do not connect or disconnect the loudspeaker cables while the mains power is on. Never operate the amplifier with any portion of bare loudspeaker wire exposed.



Never connect an output terminal to ground, or to any other input or output. Observe relative loudspeaker polarity: loudspeakers connected in reverse polarity will exhibit degraded performance, particularly in bass frequencies, and may be damaged as a consequence.



Use a high-quality stranded loudspeaker cable, and keep cable runs as short as possible.

Output bridge mode

It is possible to bridge channels in two-channel versions. When bridged, the input source must be connected to input A (A+B). Output speaker cables must be connected to the plus pole on channel A and the minus pole on B.

Most power amplifier designs, when bridged, automatically introduce a +6dB input gain boost which can lead the user to conclude that amplifier delivers “more than double the power” when in bridge mode. This is clearly not the case, as the gain boost artificially enhances perceived power at the cost of headroom. The PWM-14000 amplifier works on globally set constant gain, and automatically compensate the input gain by -6dB.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Amplifier Gain

The PWM-14000 amplifier feature adjustable input gain. This versatility enables the amplifier to accommodate a multitude of system configurations with various input sources and speaker layouts. Amplifier gain is set globally for all channels. The range is +23dB to +44dB in 3dB steps. Individual channel fine level adjustment is available using the potentiometers on the front panel.

The unique adjustable input gain feature of the PWM-14000 makes it easier to attain the optimum balance between headroom and signal-to-noise ratio in the signal path. A weak signal at the input might require the gain to be raised in order to achieve maximum output power with the lowest signal-to-noise ratio. A “hot” input signal, however, would require a lowering of the gain to avoid sending the amplifier into Voltage or Current clipping.

Channel gain/level (front-panel pots)

Individual channel gain (level) may be adjusted using the potentiometers located on the front panel. Range is from 0dB to - infinity.



If the level control is used to attenuate to a lower level than the headroom relative to input sensitivity AND the amplifier input is driven into clip, there is a danger of clipping the input stage before the current or voltage peak limiters are activated.

Amplifier sensitivity

Sensitivity is defined as how many Volts (rms) or dBu (referred to 0.775 V_{rm}) are required to achieve full (maximum) output power. As the output power varies with the load impedance, 4 ohms is usually the common reference. Since PWM-14000 amplifier is capable of providing multiple maximum output power levels through use of the VPL feature, many sensitivity calculations may be required for a single amplifier.

Output Voltage Peak Limiter (VPL)

Voltage Peak Limiter (VPL) is a unique feature in PWM-14000 amplifier. It is used to select the maximum power available on each output channel. VPL levels are set using the rear-panel DIP-switches; eight level positions are offered.

AMPLIFIER | PWM-14000

The values for VPL are displayed as maximum Voltage Peak. To translate Voltage Peak into V_{rms} , you must divide the Voltage Peak values by 1.41(see table). The VPL allows you to set the correct maximum output peak power for optimum performance with the connected speakers. The correct setting depends on the system type and the specific load connected to the channel. Since each channel can be configured to deliver either very high voltage peak power or high current draw at low-impedances, it is important to set the VPL correctly.

If you choose a lower VPL setting, you only reduce the maximum output voltage. At the same time, this allows more current headroom for low-impedance loads. The amplifier thus runs at higher efficiency, with a significantly reduced risk of going into thermal protection.

PWM-14000	
V peak	V rms
195	138
170	121
140	99
116	82
100	71
80	57
66	47
54	38

Figure 9
V peak to V_{rms} table

Output Current Peak Limiter (CPL)

The Current Peak Limiter (CPL) ensures that the amplifier will not be damaged by forcing the amplifier to deliver current levels to the outputs that exceed the physical limits of the transistors. The CPL keeps the amplifier within the Safe Operating Area (SOA).

The CPL is non-adjustable and has different limit values depending on model type.

CPL activity is indicated by illumination of an red LED for each channel on the front panel.

A steadily illuminated red CPL LED (with MUTE illuminated) indicates a short circuit situation (or very low-impedance). The output will mute for 6 seconds before measuring the output impedance again. This will continue until the short circuit is fixed, at the same time the output will automatically un-mute. An input signal must be present to allow detection of short circuit or low-impedance conditions.



The problem can be solved by checking input and output cables and examining the state of the loudspeaker load. If there is no short circuit present, then the condition may be rectified by lowering the VPL or input levels.

Protection, faults and warnings

The PWM-14000 amplifier incorporates a sophisticated and comprehensive set of protection features. Faults and warnings are indicated on the front panel.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Safe Operating Area Detector (SOAD)

The Safe Operating Area Detector (SOAD) compares output voltage against output current to ensure that the output transistors are working inside their safe operating area.

The SOAD provides fault monitoring and input to the Current Peak Limiter (CPL). The SOAD has no dedicated indicator, and its operation is revealed only in conjunction with features such as the CPL.

Very High Frequency (VHF) protection

The PWM-14000 amplifier includes protection circuits that detect continuous Very High Frequency content in the input signal. The detection begins at approximately 10KHz and moves upwards to include ultrasonic signal. If VHF signals are detected, the output will mute for 6 seconds before re-measuring. Once no continuing VHF signal is detected, the output un-mutes and returns to normal operation.

This feature recognizes that continuous full-scale VHF signals do not appear in “natural” sources such as music. Any such signals can therefore be considered as a fault when present. VHF protection is essential in avoiding damage to high frequency drivers.

The VHF protection operational area is dependent on output power level and frequency. The illustration below shows a decreasing threshold on the output power level, starting at approximately 10KHz and rising with a -6dB slope. This defines the VHF protection area. When continuous output power above the threshold line is detected the VHF protection becomes active.

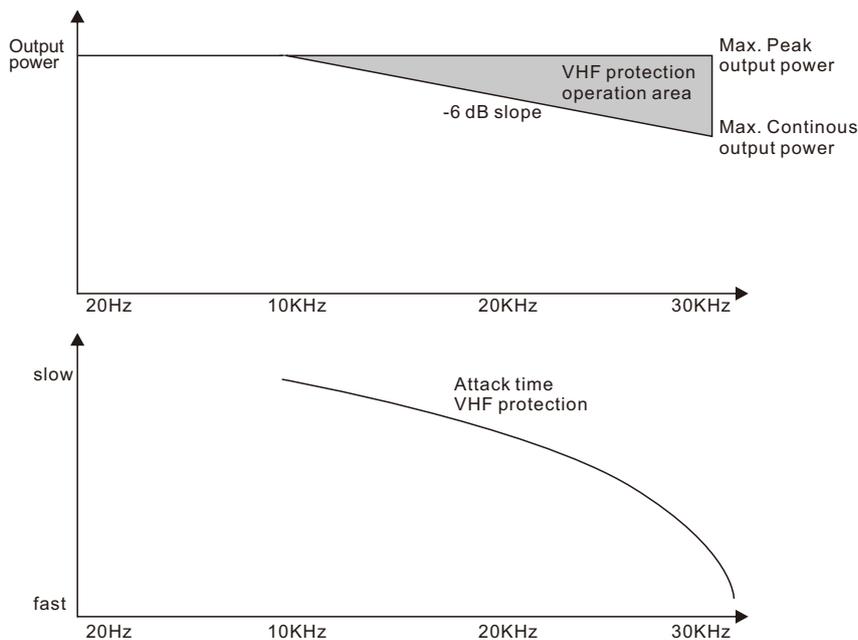


Figure 10

VHF protection attack time vs output power/frequency

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

The Attack time for the VHF protection is increasingly shorter at higher frequencies. For example, an ultrasonic continuous signal will cause the outputs to mute rapidly, where it will take several milliseconds for a 10KHz continuous signal to trigger the output mute. This is shown in the illustration above.

The VHF protection is not a limiter and does not alter the amplifier's frequency response. It is implemented solely to detect continuous VHF content. The amplifier will always pass VHF peaks at full power, with no effect on musical "transients".

The VHF protection is indicated by a yellow LED on the amplifier front panel, with output muting for 6 seconds when in action.



If you bench test the amplifier using a continuous, full scale sine-wave input above 10KHz, the VHF protection will activate and prevent measurement of full peak output power. (Output will be muted long before maximum output power is attained.) To measure the true peak output power, use a burst signal.

DC protection



DC protection is implemented on each output to prevent damage to connected loudspeakers. DC present at the output will trigger muting and illuminate the fault LED indicator. Any DC present at the output indicates a hardware malfunction that requires servicing of the amplifier.

High-impedance warning (open load)

A high-impedance (open load) condition is indicated when an input signal above approximately -29dB is detected and no functioning loudspeakers are connected to the amplifier. The fault is indicated by a red Sig/Hi-imp LED. The indicator is green when a valid load is present under the same input signal conditions.



Since the Hi-impedance detection initially triggers only when the input signal rises above -29dB, it might cause the indicator to first turn green, and then red, even in situations where no speaker is connected.

Low-impedance protection warning

A low impedance or short circuit fault is detected when current draw is high (Current Peak Limiter active) and when, simultaneously, output signal is low (-4dB LED does not illuminate). When this occurs, the amplifier protects the output stage from damage by muting the output signal and bypassing the circuits. Indication of this fault is a constant red illumination of the Current Peak Limiter (CPL) LED on the front panel. The protection will sequence at 6 second intervals to re-measure conditions. If the low-impedance fault is no longer detected, the amplifier will un-mute.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance



If the CPL turns constant red, the output is muted, and the -4dB signal LED is on, then the amplifier has gone into maximum current protection. This situation is caused by an excessive input signal and is not due to a short circuit. Turn down the input signal to avoid or remedy this situation.

Temperature protection

Thermal measurement points are provided on each output channel as well as on the power supply. These indicators will, if the pre-specified temperature level is exceeded, give a high temperature warning. This warning condition is indicated by a flashing TEM LED on the front panel.

As the amplifier approaches a thermal protection threshold, the warning LED sequence will start with short “on-time” bursts. If the amplifier continues to overheat and approaches the temperature limit, the flashing sequence will be defined by longer and longer on-time bursts until the protection mode is activated.

If the temperature becomes too high to continue safe operation, the overheated output channel(s) will be muted until the temperature returns to an acceptable level.

Fully active temperature protection (with muting) is indicated by a constantly illuminated TEM LED. Temperature measurements will continue at 6 second intervals. The output will un-mute when the channel or power supply returns to a safe operating temperature.

Power Average Limiter (PAL)

The Power Average Limiter (PAL) controls the current-drawing relationship between the power supply and the mains inlet. PAL limits the maximum average power consumption according to the power supply capabilities, ensuring that the PSU will not overload. In addition, in the larger models that potentially could pull more current from the mains than the mains fuses are specified to handle (more than 16A), PAL limits the amplifier’s maximum current draw to prevent blowing the mains fuse.

Soft-Start

High powered amplifiers with inadequate inrush limiting can pull considerable current from the mains at turn-on. This can result in tripping of fast-acting mains breakers. Such is not the case with PWM-14000 amplifier. The PWM-14000 amplifier has very low inrush power as the capacitors are charged slowly and in a controlled manner ensuring that breakers will not trip.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Front-panel monitoring and adjustments

Level indicators

The front-panel displays an array of ten LED indicators for level and status monitoring of each amplifier channel. Indications related to signal levels are as follows:

- ◆ **Red CPL (Current Peak Limiter)** flashing Indicates that output signal has reached the limit of the output devices and limiting is in effect.
- ◆ **Red VPL / CLIP** Indicates that signal has reached maximum output voltage. (Maximum voltage is determined by rear-panel VPL settings.)
- ◆ **Green SIG to -4** Indicates output signal levels in normal operating range.
- ◆ **SIG+HI-IMP (green / red)** Indicates input signal above -44dB. Should the SIG indicator turn red, this indicates a “high-impedance” or open connection has been detected at the output. Possible faults include a disconnected cable or malfunctioning loudspeaker. (In some cases a normal condition, such a sub-bass enclosure with high-impedance at a certain frequency, can trigger this indication.) If the -10dB LED illuminates and the HI-IMP LED turn red, then the amplifier has detected an open load (no loudspeaker connected).

Level adjust

Level adjust potentiometers (one per channel) are located on the front panel adjacent to the LED display. The potentiometer’s operational range is 0dB to minus infinity.

Mute indication

Individual channel Mute is indicated by illumination of the red Mute LED provided for each channel.

Performance, Warning and Fault indicators: Global Indicators:

- ◆ **Power on / off** (green) indicates that mains power is switched on.
- ◆ **PAL**, Power Average Limiter (red), indicates that the amplifier is limiting because the power supply and / or the mains-inlet fuse has reached maximum capability.

AMPLIFIER | PWM-14000

Precautions | Introduction | Front Panel | Rear Panel | Operation and Performance

Channel Indicators:

- ◆ **Bridge mode** (yellow) indicates if two channels are bridged using the DIP-switch on the rear panel.
- ◆ **CPL**, Current Peak Limiter (red), when flashing indicates the maximum possible current draw has been reached.
- ◆ **CPL**, Current Peak Limiter (red), when constant indicates excessive current draw caused by a short circuit on the output or very low operational impedance. MUTE LED will illuminate and the output will mute for 6 seconds before re-measuring the output impedance. This will continue until the short circuit is removed. CPL remains constant red in a fault condition only when an input signal is present.
- ◆ **Temperature** (yellow) warning is indicated by a flashing LED. If the amplifier goes into thermal protect (output muted), the TEM LED illuminates constant yellow and the red MUTE LED illuminates.
- ◆ **VHF**, Very High Frequency protection (yellow) indicates that potentially harmful continuous high frequencies have been detected on the input signal. The output is muted (MUTE LED on).
- ◆ **Hardware fault** is indicated when both the CPL and TEM, VHF and MUTE indicators light up simultaneously. The amplifier requires servicing before placing back in operation.

Maintenance

During normal operation your PWM-14000 amplifier will provide trouble-free service. The only user maintenance required is to periodically vacuum clean the foam dust-filters behind the front grille.

In some extreme cases it may be necessary for authorized service personnel to clean the inside of the amplifier. These conditions usually occur after prolonged use in extreme environments such as those using “cracked oil” smoke machines. If you are using your amplifier in a heavy duty application, it is recommended to have your amplifier serviced every 3 years purely a preventative action.

AMPLIFIER | PWM-14000

SPECIFICATIONS

General

Number of channels	2
Peak total output both channels driven	14000 W
Peak output voltage per channel	195 V
Max. output current per channel	85 A peak

General

Max. Output Power	2 ohms	4 ohms	8 ohms	16 ohms
Per ch. (both ch.'s driven)	7000 W	4400 W	2350 W	1200 W
Bridged per ch.	not recommended	14000 W	8800 W	4700 W

Performance with Gain: 35 dB and VPL: 195 V

THD 20 Hz - 20 KHz for 1 W	<0.1%
THD at 1 KHz and 1 dB below clipping	<0.05%
Signal To Noise Ratio	>112 dBA
Channel separation (Crosstalk) at 1 KHz	>70 dB
Frequency response (1 W into 8 ohms) +0/-3 dB	2 Hz - 34.2 KHz
Input impedance	20 KOhm
Input Common Mode Rejection, CMR	54 dB
Output impedance @ 100 Hz	19 mOhm

Voltage Peak Limiter (VPL), max. peak output

VPL, selectable per ch.	195, 170, 140, 116, 100, 80, 66, 54 V
VPL, selectable when bridged	390, 340, 280, 232, 200, 160, 132, 108 V
Voltage Peak Limiter mode (per ch.)	Hard / Soft

Gain and Level

Amplifier gain selectable (all channels) – rear-panel switches	23, 26, 29, 32, 35, 38, 41, 44 dB
Default gain	35 dB

Connectors and Switches

Input connectors (per ch.)	3-pin XLR, electronically balanced
Output connectors (per ch.)	Binding Posts 2-pole
Output bridge mode	A+B - Ch. A is signal input source
Intelligent fans (on/off)	Yes, depending on presence temperature of the copper heatsink
Cooling	Two Fans, Front-to-Rear Airflow, Fixed-Speed or Temperature Controlled Speed

Front-panel indicators:

Common	Power Average Limiter (PAL); Power on; Bridge (A+B)
Per channel	Signal present / High-impedance; -20 dB, -15 dB, -10 dB and -4 dB output signal; Voltage Peak Limiter (VPL); Current Peak Limiter (CPL); Very High Frequency (VHF); High temperature; Fault; Mute

Power

Minimum power-up voltage, 220 V / 110 V	190 V / 95 V
Power Average Limiter (PAL)	Yes
Soft start / Inrush Current Draw	Yes / max. 5 A

