



SA-250DSP & SA-500DSP

SUBWOOFER AMPLIFIERS

Owner's Manual

Important Safety Information



The lightning flash with the arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.



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 product.

CAUTION! DO NOT open the amplifier, attempt any modifications or repairs. There are extremely high voltages present and any servicing must be referred to RBH Sound or an authorized qualified technician.

ATTENTION! Opening the amplifier will void warranty.

WARNING! To prevent shock or fire hazard, never permit moisture or any liquid to get into the amplifier. If an accidental spill occurs, immediately shut off the power, unplug its A/C power cord and seek a qualified technician for repair.

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

All safety instructions should be read before this subwoofer amplifier is operated. Please retain these safety instructions for future reference. Adhere to all warnings on the amplifier and in this manual.

Ventilation: The amplifier should be situated so that its location or position does not interfere with its proper ventilation. The amplifier should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings, nor should it be placed in a built-in installation such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

Power Source: The amplifier should only be connected to a power supply of the type described in this instruction manual or as marked on the amplifier. Precautions should be taken so that the grounding or polarization means of the amplifier are not defeated.

Power Cords: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to wall receptacles and the point where they exit from the amplifier.

Object and Liquid Entry: The amplifier should not be exposed to dripping or splashing and objects filled with liquids, such as vases or plants, should not be placed on top of or next to the amplifier. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through its ventilation openings.

Damage Requiring Service: This amplifier should be serviced by a qualified technician when:

- The power supply cord has been damaged; or
- Objects have fallen or liquid has been spilled into the amplifier; or
- The amplifier does not appear to function normally or exhibits a marked change in performance; or
- The amplifier has been dropped or the enclosure is damaged.

Introduction

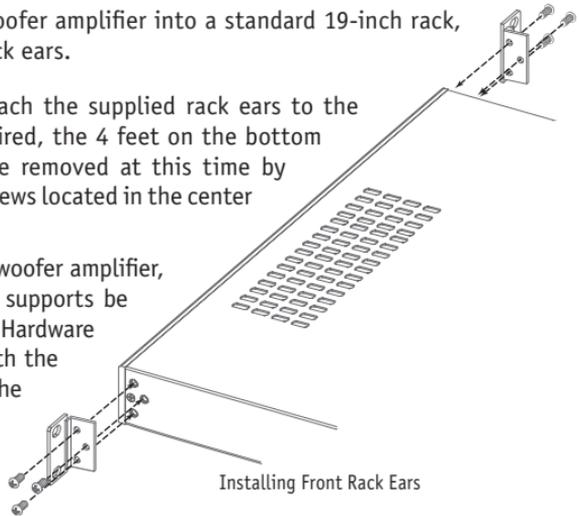
Congratulations on your purchase of an RBH Sound Subwoofer Amplifier! Your subwoofer amplifier is the result of many years of research and development dedicated to producing powerful, accurate bass in home audio systems. This manual contains operating procedures and specifications. We recommend you thoroughly read through the material contained in this manual before connecting your amplifier. This will ensure you have an understanding of how to setup and operate your amplifier for optimum performance.

The RBH Sound SA-250DSP/SA-500DSP subwoofer amplifier is a high performance, class D subwoofer amplifier capable of delivering a minimum of 250W/500W of clean power at 4 ohms. It uses sound processing technology which allows you to tailor the performance of the subwoofer to better match the environment in which it is installed. Both amplifiers feature a large LCD display as well as a turn-and-push controller for DSP configuration. On the front panel there are indicators for power and standby, clipping and signal presence.

Installing Rack Mount Ears

If you plan to install your subwoofer amplifier into a standard 19-inch rack, you must install the supplied rack ears.

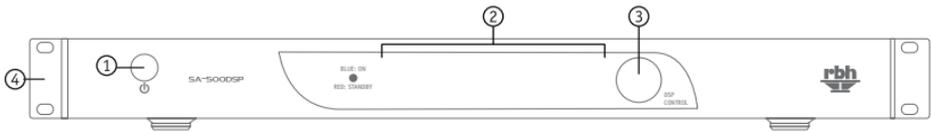
1. Using the three screws, attach the supplied rack ears to the subwoofer amplifier. If required, the 4 feet on the bottom of the amplifier can also be removed at this time by unscrewing the mounting screws located in the center of each foot.
3. Due to the weight of the subwoofer amplifier, it is recommended that rear supports be secured to the rear rack rails. Hardware to do this is not supplied with the amplifier and is specific to the type and depth of rack you are using.



CAUTION! The subwoofer amplifier is convection cooled and does not use a fan. For this reason, ensure there is adequate ventilation above and below the subwoofer amplifier when rack mounted. Avoid placing heat generating equipment below it in the rack. If the subwoofer amplifier does not receive enough ventilation, it may overheat and switch to standby mode.

Subwoofer Amplifier Controls and Setup

FRONT PANEL



1. **Power Switch:** Turns the amplifier on or off. Amplifier must be on for the trigger or auto sense modes to operate.
2. **16 Character x 2-row Liquid Crystal Display:** Shows the amplifier's status, menus and settings and works in conjunction with the turn and push navigation controls and the remote control.
3. **Programming Navigation Control:** Used to scroll through the display menus, change settings and program the DSP controller.
4. **Optional Rack Ears:** Two rack mount ears are provided for a 19-inch rack mounting.



REAR PANEL

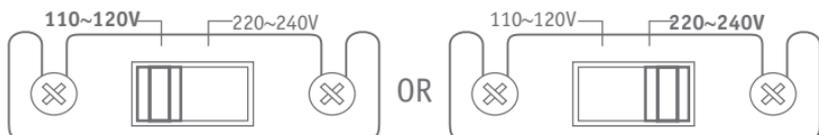
1. **Input:** For receiving line-level signals. Accepts either a mono or LFE signal.
2. **Output:** For sending line-level signals to another amplifier.
3. **XLR Balanced Input:** For receiving balanced signals. Accepts either a mono or LFE signal.
4. **XLR Balanced Output:** For sending balanced signals to another amplifier.
5. **12V Trigger Input:** For triggering the power on/off from other devices such as processors or receivers that have a 12V trigger output. 6V minimum required for triggering.

NOTE: Once in trigger mode, the amplifier cannot be turned on without a 12V trigger signal. To disable the 12V trigger, press and hold the navigation control knob. The power switch must be in the ON position. The trigger mode will be turned off and the amplifier will power on.

6. **Service:** For uploading new firmware or updates.
7. **5-way Binding Posts:** Connect your subwoofer here. Minimum impedance of the load is 4 Ohms. Multiple subwoofers can be connected if the combined load impedance is 4 Ohms or greater.

Amplifier Controls and Setup (continued)

8. **Voltage Selector Switch:** The subwoofer amplifier can be used on 110~120V (60Hz) or 220~240V (50 Hz) line voltage. To change the operating line voltage, turn the power off using the power switch and unplug the power cord. Remove the plastic cover screws and the plastic cover over the voltage selector located on the rear of the subwoofer amplifier. Set the switch to the correct position for the line voltage in your country. Replace the plastic cover and screws over the voltage selector switch.



NOTE: If required, remove the IEC line cord and replace with an IEC AC cable that matches the AC wall socket, this should be a 10A rated cable. When the voltage selector switch is changed, the fuse must also be changed to continue to provide protection to the amplifier.

9. **Power Cord Receptacle:** The supplied power cord needs to be connected to this receptacle in order for the Subwoofer Amplifier to work properly.

WARNING! Make certain that you are using the proper power cord and voltage selection for the type of AC power supplied in your country.

10. **Fuse Holder:** This is the power fuse access.

WARNING! In the event the fuse must be replaced, the replacement fuse must match exactly the original fuse value. If the replacement fuse is not of the same value, damage to the Subwoofer Amplifier may result. **Use a GDA type fuse for the SA-250DSP: 5A 120V or 2.5A 240V fuse, and for the SA-500DSP use a 8A 120V or 4A 240V fuse.**

CAUTION! Before replacing the fuse, disconnect the power cord from the power receptacle.



11. **Removable Feet:** The amplifier feet can be removed as required for rack mount installation.

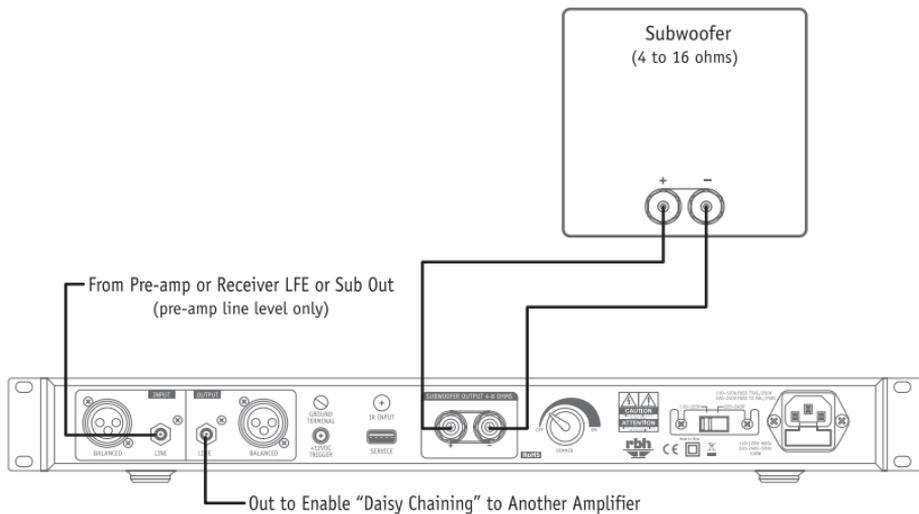
12. **IR Input:** Link to Infrared (IR) hub.

13. **Dimmer:** Controls the light output level of the status LED and the LCD display panel.

Connections

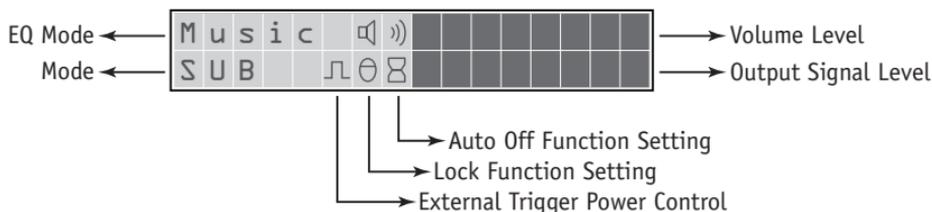
Using line level inputs:

NOTE: Speaker-level inputs are not used in this system.



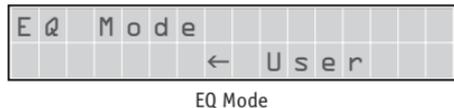
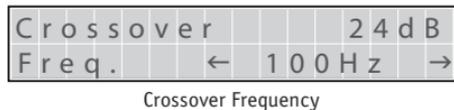
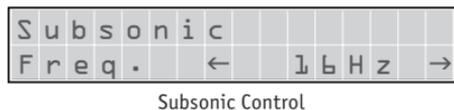
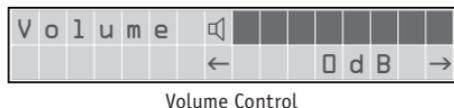
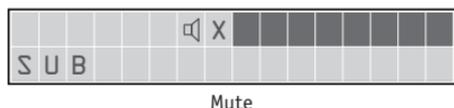
LCD Display Screens / Functions

Normally, the LCD display will show the status for a number of settings as well as the volume level and a flashing output level bar display. The “normal” display is shown below.



Navigation through the function menus and settings are done via the programming navigation knob on the front of the subwoofer amplifier. By pressing the programming navigation knob, the amplifier will switch to the setting mode, and the first screen to appear will be the “Subsonic Frequency” display, by pressing this knob again it will run through the different function screens. To select a new option for a setting, turn the knob left. The active option will have an asterisk next to it.

Once you have configured all the settings for your amplifier, you can save them by using the “Memory Store” screen. This way, if the settings are accidentally changed, you can always recall your saved settings. You can also revert to the factory default settings by recalling “Default” in the “Memory Recall” function.



Mute: This feature allows you to mute and un-mute.

Volume Control: To adjust the output in your system. The volume control should be set to achieve similar volume level from both the main speakers and subwoofer.

Subsonic Control: This feature allows you to select the frequency at which you wish to cut off the low-pass audio signal. Values are: FLAT, 16, 20, 25, 31 or 40 Hz.

Crossover / Frequency: This feature allows you to select the frequency at which you wish to cut off the high-pass audio signal. Values are: 40, 50, 63, 80, 100, 125 or 160 Hz. This feature only available in Sub Mode.

Crossover / Slope: This feature allows you to select the slope for the crossover. Values are: -12, -18, -24, -30, -36 dB/oct. This feature only available in Sub Mode.

EQ Mode: There are six preset modes; Defeat, Music, Movie, Impact, Dynamic and User.

LCD Display Screens / Functions (continued)



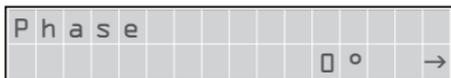
User EQ Setup →

User EQ (Setup)



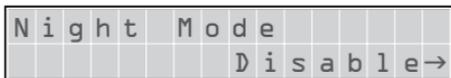
User EQ (Frequencies)
← 40 Hz → -3.0 dB

User EQ (Frequencies)



Phase 0° →

Phase Control



Night Mode Disable →

Night Mode



Auto off
← 15 min →

Auto Off



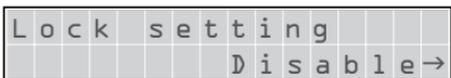
Mode select SUB →

Mode Select



External Trigger OFF →

External Trigger



Lock setting Disable →

Lock Setting



Memory Store
← Mem 1 →

Memory Store



Memory Recall
← Mem 1 →

Memory Recall

User EQ: This feature allows you to setup equalizer frequency and gain. Turn to the left to set the frequency, turn to the right to set gain. Frequencies are: 20, 25, 31, 40, 50, 63, 80, 100 or 125Hz, the gain range is -6dB to +6dB.

Phase Control: This feature is used to adjust the subwoofer's acoustic phase to match that of your main speakers. Values are: 0°, 45°, 90°, 135°, 180°, 225°, 270° or 315°.

Night Mode: Limits the dynamic range of the amplifier so the louder context of the source signal is reduced. The feature allows you to select night mode. Choose enable or disable.

Auto Off: This feature allows the amplifier to turn itself off when not in use. With the function set to active, the amplifier will monitor its input signal, and if there is no signal present it will shut down and go into standby mode. As soon as a signal is present, the amplifier will turn itself back on. Values are: Disable, 5, 10, 15, 20, 25 or 30 minutes.

Mode Select: This feature allows you to select a mode. Set values contain: SUB or LFE (refer to flow charts on pages 8-9).

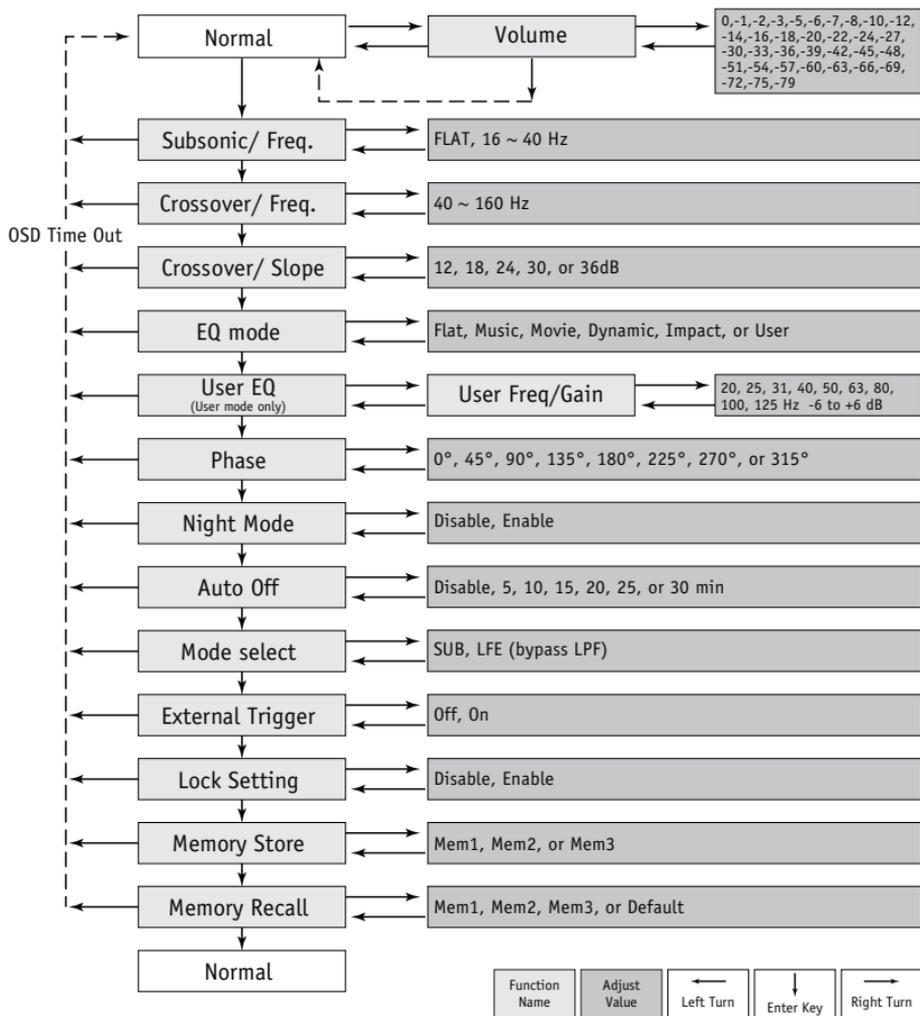
External Trigger: This feature allows you to select the enable external trigger function. Press and hold the Navigation control knob with the power switch in the ON position to change.

Lock Setting: When this function is active, all settings will be protected until disabled. Values are: Disable or Enable.

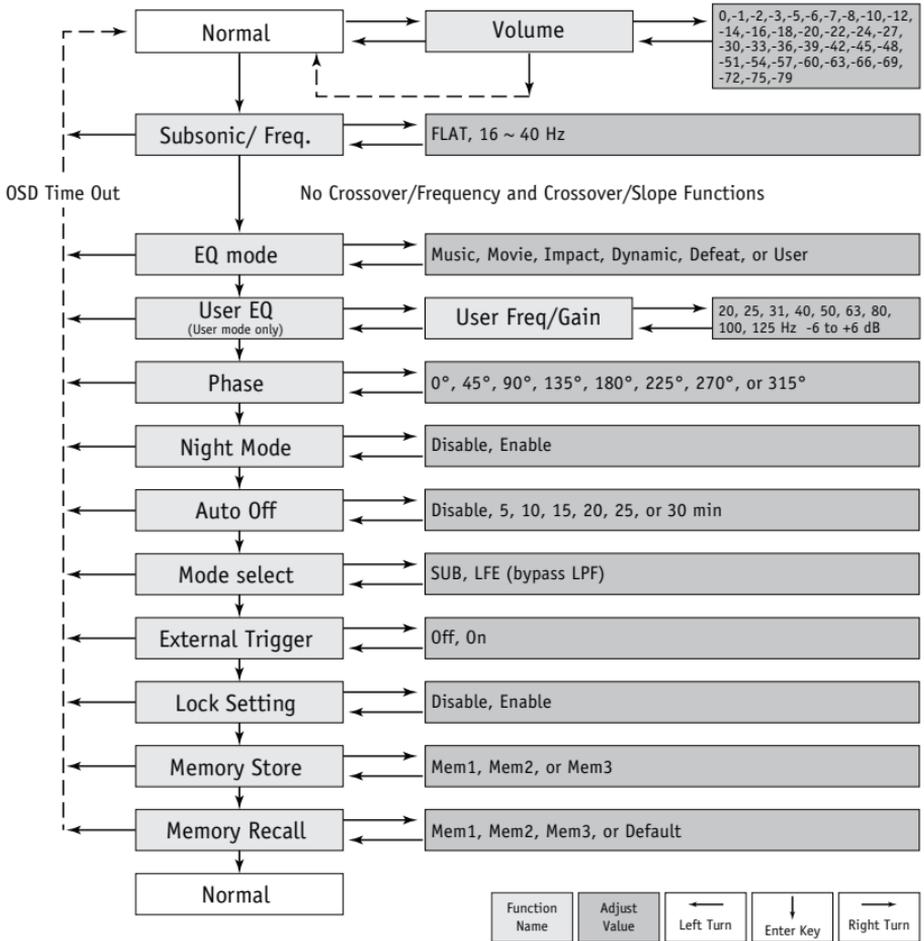
Memory Store: This feature allows you to select the memory bank. There are three memory banks, consisting of Mem1, Mem2 and Mem3.

Memory Recall: The feature allows you to recall settings saved using the "Memory Store" function. There are four memory banks total, consisting of Mem1, Mem2, Mem3 and Default. Default resets to factory default settings.

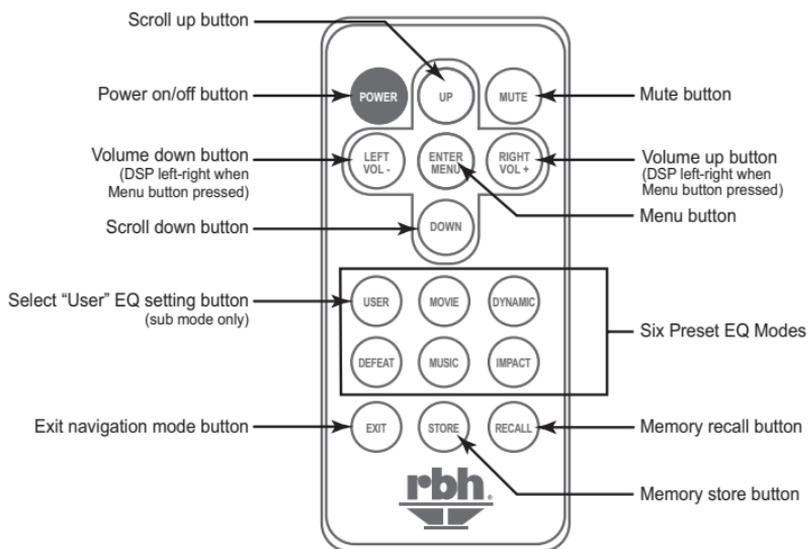
Control Flow Chart—SUB Mode



Control Flow Chart—LFE Mode



Remote Control



The remote control duplicates the functions of the programming navigation control knob on the front of the subwoofer amplifier, plus adds some additional functions such as power on/off, mute on/off, and one button selection of the six EQs. In a typical home theater installation however, the remote will most likely NOT be used, as the subwoofer amplifier will be configured to a specific subwoofer and room placement, and controlled by the main processor or receiver.

IR CODES

IR2 consumer code 7D (hex), 2B (hex)

| | | |
|--------------------|---------------|-----------------|
| POWER_ON 48 (Hex) | PRE3 B8 (Hex) | MUTE A0 (Hex) |
| POWER_OFF 28 (Hex) | PRE4 78 (Hex) | UNMUTE 08 (Hex) |
| PRE1 58 (Hex) | USER A8 (Hex) | VOL_DN C0 (Hex) |
| PRE2 88 (Hex) | DEFU D8 (Hex) | VOL_UP E0 (Hex) |

Specifications

| Model: | SA-250DSP | SA-500DSP |
|--|--|--|
| Amplifier Type: | High-efficiency Class D Amplifier with Toroidal Power Supply | High-efficiency Class D Amplifier with Toroidal Power Supply |
| Power Output: | 250 Watts (RMS @ 4 Ohms) | 500 Watts (RMS @ 4 Ohms) |
| Total Harmonic Distortion (THD): | <1% | <1% |
| Customized Preset Modes: | Up to 4 Types | Up to 4 Types |
| Equalizer: | Adjustable Built-in 10-Band (-6dB to +6dB) | Adjustable Built-in 10-Band (-6dB to +6dB) |
| Adjustable Low Pass Crossover: | 40Hz to 160Hz / 1Hz Increments | 40Hz to 160Hz / 1Hz Increments |
| Adjustable Slope: | 12dB-36dB / Octave | 12dB-36dB / Octave |
| Line Level Input Sensitivity: | 190 mV | 190 mV |
| Phase Control: | 0 to 315° / 45° Increments | 0 to 315° / 45° Increments |
| Auto Turn-on Sensitivity: | 3 mV @ 50 Hz | 3 mV @ 50 Hz |
| Automatic Wakeup Power On/Off Signal Input: | 5 to 30 minutes (selectable) | 5 to 30 minutes (selectable) |
| External Trigger: | 12V | 12V |
| Thermal Protection Circuit: | Yes | Yes |
| Night Mode: | Yes | Yes |
| Remote Control: | Yes | Yes |
| USB Updatable: | Yes | Yes |
| Single Ended and Balance Input: | Yes | Yes |
| Rack Mount Holes (Center to Center): | Horizontal 18.3" (465mm) Vertical 1.18" (30mm) | Horizontal 18.3" (465mm) Vertical 1.18" (30mm) |
| Dimensions (without rack mounts): | 17.125" W (435mm) 1.75" H (45mm) 10.375" D (264mm) | 17.125" W (435mm) 1.75" H (45mm) 10.375" D (264mm) |
| Dimensions (with rack mounts): | 19" W (483mm) 1.75" H (45mm) 10.375" D (264mm) | 19" W (483mm) 1.75" H (45mm) 10.375" D (264mm) |
| Weight: | 13 lbs. (5.9 kg) | 16 lbs. (7.26 kg) |
| Warranty: | 1 year | 1 year |
| Fuse: | 5 Amp (120V) 2.5Amp (240V) | 8 Amp (120V) 4 Amp (240V) |

Troubleshooting

| Situation: | Probable Cause: | Solution: |
|--|---|---|
| No sound from the subwoofer(s). | Amplifier is not connected to constant A/C power outlet. | Make certain the amplifier is plugged into an unswitchable A/C power outlet. |
| | Subwoofer(s) is/are not connected to the amplifier correctly. | Make certain that subwoofer(s) is/are connected properly (refer to the connections section of this manual). |
| | Amplifier is not receiving an audio signal from the pre-amp/receiver. | Make certain there is an audio signal from pre-amp/receiver and audio connections resemble those in the connections section of this manual. |
| | Electrical short in wiring. | Verify that all connections are complete and secure, with no stray wires contacting other terminals. |
| | Amplifier fuse might be blown. | Replace fuse (if fuse is not readily accessible, consult your authorized RBH dealer). WARNING: Before replacing fuses, please see the rear panel features/controls section of this manual. |
| Sound from at least one subwoofer, but not the other(s). | Bad connection(s) to non-working subwoofer(s). | Verify all wires are properly connected. |
| | Electrical short in wiring. | Verify that all connections are complete and secure, with no stray wires contacting other terminals. If problem is in wire itself, replace the suspect wire. |
| | If one subwoofer is damaged due to being overdriven, then it may have a negative effect on another subwoofer used in a series connection. | Check each individual subwoofer to verify each is still operational. |
| Performance is less than expected. | The + and – polarity of the subwoofer wire might be reversed on the subwoofer. | Check the entire system for proper polarity. |
| | Crossover frequency is not adjusted correctly. | Adjust crossover frequency until desired sound is obtained. |

Warranty

Your RBH Sound SA-250DSP/SA-500DSP subwoofer amplifier is covered by a limited warranty against defects in materials and workmanship for a period of 1 (one) year from the original date of purchase. This warranty is provided by the authorized RBH Sound dealer where the subwoofer amplifier was purchased. Warranty repair will be performed only when your purchase receipt is presented as proof of ownership and date of purchase. Defective parts will be repaired or replaced without charge by your dealer's store or by RBH Sound authorized locations to service RBH Sound products. Charges for unauthorized service and transportation cost are not reimbursable under this warranty. This warranty becomes void if the product has been damaged by alteration, misuse or neglect. RBH Sound assumes no liability for property damage or any other incidental or consequential damage whatsoever which may result from the failure of this product. Any and all warranties of merchantability and fitness implied by law are limited to the duration of this express warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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