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Dayton Audio SPA250DSP

Dayton Audio SPA250DSP 250W Subwoofer Plate Amplifier with DSP Instruction Manual

Model: SPA250DSP

Introduction

The Dayton Audio SPA250DSP is a high-performance 250-watt subwoofer plate amplifier featuring integrated Digital Signal Processing (DSP). This amplifier is engineered to provide powerful and precise low-frequency reproduction, making it suitable for custom subwoofer applications. Its advanced DSP capabilities allow for detailed audio customization and optimization, ensuring optimal sound performance tailored to your specific acoustic environment and subwoofer characteristics.

Safety Information

Please read and understand all safety instructions before operating this device. Retain this manual for future reference.

- **WARNING:** To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture.
- **CAUTION:** To reduce the risk of fire, replace with only the same type and rating of fuse. Refer to the specifications section for fuse details.
- Ensure the voltage selector switch (115V/230V) is set correctly for your region's power supply before connecting the amplifier to an AC outlet. Incorrect voltage selection can cause severe damage to the unit.
- Do not open the amplifier enclosure. There are no user-serviceable parts inside. Refer all servicing to qualified service personnel.
- Disconnect the power cord from the AC outlet before performing any maintenance or making connections.

Product Overview

Key Features

- Integrated DSP functions including 7 PEQ bands, Low-Pass Filter (LPF), phase control, subsonic filter, limiter, mains delay, and High-Pass Filter (HPF).
- User-friendly single-knob control panel with a high-contrast LCD display and status LEDs for direct adjustments.
- Fast and intuitive PC-based GUI software for comprehensive access and control over all DSP functions.
- Efficient Class D output topology, delivering high-impact low-frequency performance.

- Versatile input and output options, including both balanced (XLR) and unbalanced (RCA) line-level connections.

Controls and Connections

The rear panel of the SPA250DSP amplifier provides all necessary controls and connection points for integration into your audio system.



Figure 1: Rear panel of the Dayton Audio SPA250DSP amplifier. This image displays the layout of all input and output connections, power controls, and the DSP control interface.

- **Power Mode Switch:** Selects between AUTO (automatic power on/off based on audio signal), ON (always on), and RED-STB/GRN-ON (status indicators).
- **Input Level Switch:** Toggles between HIGH-LEVEL and NORMAL input sensitivity.
- **Balanced Inputs (LEFT/RIGHT XLR):** Professional-grade balanced audio inputs for connecting to compatible audio sources.
- **Unbalanced Inputs (LEFT/RIGHT RCA):** Standard unbalanced audio inputs for connecting to consumer-grade audio sources.
- **Balanced Outputs (LEFT/RIGHT XLR):** Balanced audio outputs for passing the signal to other audio equipment.
- **USB Control Port:** Connects to a PC for DSP software control and firmware updates.
- **Power Switch (ON/OFF):** Main power toggle for the amplifier.
- **AC Inlet:** Connection point for the detachable AC power cord.
- **Voltage Selector:** Switch to select between 115V and 230V AC input voltage.
- **Feature Setup Knob/LCD:** Used for direct adjustments of basic DSP parameters and menu navigation on the amplifier itself.

Setup

Physical Installation

The SPA250DSP is designed for surface mounting. Ensure the mounting surface is stable and provides adequate ventilation around the amplifier. Use appropriate screws and tools for secure installation into your subwoofer enclosure.

Connecting Audio Sources

- **Unbalanced Connection (RCA):** Connect RCA cables from your audio source (e.g., AV receiver, pre-amplifier) to the LEFT and RIGHT UNBALANCED INPUTS on the amplifier.
- **Balanced Connection (XLR):** For professional setups, connect XLR cables from your audio source to the LEFT and RIGHT BALANCED INPUTS.
- **High-Level Input:** If your source does not have dedicated line-level outputs, you can use the high-level inputs. Connect speaker wires from your main amplifier's speaker outputs to the high-level input terminals on the SPA250DSP. Ensure correct polarity.

Connecting to Subwoofer

Connect the speaker wires from the amplifier's output terminals to your subwoofer driver. Ensure correct polarity (+ to + and - to -). Use speaker wire of appropriate gauge for the power output and length of the run. Ensure the speaker wire is long enough to reach the subwoofer terminals comfortably after mounting the plate amplifier.

Power Connection

1. Verify the voltage selector switch on the rear panel is set to the correct voltage for your region (115V or 230V).
2. Connect the provided AC power cord to the AC inlet on the amplifier and then to a grounded electrical outlet.

Operating Instructions

Initial Power-Up

1. After all connections are made, set the Power Mode switch to 'ON' or 'AUTO'.
2. Flip the main Power switch to the 'ON' position. The LCD display will illuminate, and status LEDs will indicate operation.

Basic Adjustments (On-Unit Controls)

The single-knob control and LCD display allow for basic adjustments directly on the amplifier:

- **Volume:** Rotate the knob to adjust the overall output volume of the subwoofer.
- **Menu Navigation:** Press the knob to enter the menu, then rotate to scroll through options and press again to select. Basic DSP parameters like LPF frequency and phase can be adjusted here.

Power Mode Settings

- **ON:** The amplifier remains powered on continuously.
- **AUTO:** The amplifier will automatically power on when an audio signal is detected and enter standby mode after a period of no signal. The status LEDs (RED-STB for standby, GRN-ON for active) indicate the current state.

DSP Software Control

The SPA250DSP's full potential is unlocked through its PC-based Graphical User Interface (GUI) software. This software provides comprehensive control over all Digital Signal Processing functions.



Figure 2: Dayton Audio DSP software interface. This image shows the graphical user interface for controlling the amplifier's digital signal processing functions, including equalization curves.

Connecting to PC

Connect a USB cable (Type A to Type B, often referred to as a printer cable) from your computer to the USB Control Port on the amplifier's rear panel. The necessary drivers and software can typically be downloaded from the Dayton Audio website.

DSP Functions Available via Software

- **7-Band Parametric Equalizer (PEQ):** Allows for precise frequency response adjustments to compensate for room acoustics or subwoofer characteristics.
- **Low-Pass Filter (LPF):** Configures the upper frequency limit of the subwoofer.

- **Phase Control:** Adjusts the phase relationship between the subwoofer and main speakers for seamless integration.
- **Subsonic Filter:** Protects the subwoofer from damaging ultra-low frequencies below its operational range.
- **Limiter:** Prevents amplifier clipping and speaker damage by limiting output levels.
- **Mains Delay:** Synchronizes the subwoofer output with the main speakers.
- **High-Pass Filter (HPF):** Can be used to filter out low frequencies from the line outputs if passing the signal to other full-range speakers.

Maintenance

Proper maintenance ensures the longevity and optimal performance of your SPA250DSP amplifier.

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the amplifier. Do not use liquid cleaners or solvents, as they may damage the finish or internal components.
- **Ventilation:** Ensure that the amplifier's ventilation openings are not blocked. Adequate airflow is crucial to prevent overheating.
- **Fuse Replacement:** If the amplifier fails to power on, the fuse may need replacement. Disconnect the power cord before attempting to replace the fuse. The fuse holder is located near the AC inlet. Replace only with a fuse of the same type and rating as specified in the Specifications section (115V: T4AH/250V, 230V: T2AH/250V).
- **Storage:** If storing the amplifier for an extended period, disconnect it from power and store it in a cool, dry place away from direct sunlight and extreme temperatures.

Troubleshooting

This section addresses common issues you might encounter with your SPA250DSP amplifier.

Problem	Possible Cause	Solution
No power / Amplifier does not turn on	• Power cord not connected • Power switch off • Incorrect voltage selection • Blown fuse	• Ensure power cord is securely connected. • Turn main power switch ON. • Verify voltage selector is set correctly (115V/230V). • Check and replace fuse if necessary (refer to Maintenance).
No sound output	• Input cables disconnected or faulty • Subwoofer speaker wires disconnected or incorrect polarity • Input Level switch set incorrectly • Volume too low • DSP settings (e.g., LPF too low, mute enabled)	• Check all audio input cables for secure connection. • Verify subwoofer speaker wires are connected correctly and securely. • Ensure Input Level switch matches your source (HIGH-LEVEL/NORMAL). • Increase volume using the knob or DSP software. • Review DSP settings via software to ensure LPF is appropriate and no mute is active.

Problem	Possible Cause	Solution
Distorted sound	• Input signal too high • Volume too high • DSP limiter engaged excessively • Faulty speaker or wiring	• Reduce the input signal level from your source. • Lower the amplifier's volume. • Adjust DSP limiter settings via software. • Inspect subwoofer and wiring for damage.
DSP software connection issues	• USB cable not connected or faulty • Missing or incorrect USB drivers • Software not installed correctly	• Ensure USB cable is securely connected to both PC and amplifier. • Download and install the latest USB drivers and software from the Dayton Audio website. • Try a different USB port or cable.

Specifications

Model Number	SPA250DSP
Output Power	250 Watts
Number of Channels	1
Dimensions (L x W x H)	16 x 11 x 8 inches (Product Dimensions)
Item Weight	3.63 pounds
Mounting Type	Surface Mount
Manufacturer	Dayton Audio
UPC	848791004049
Safety Certification	FCC
Fuse Rating (115V)	T4AH/250V
Fuse Rating (230V)	T2AH/250V

Warranty and Support

Warranty Information

The Dayton Audio SPA250DSP amplifier typically comes with a five-year warranty. Please refer to your purchase documentation or the official Dayton Audio website for specific warranty terms and conditions, as these may vary by region and retailer.

Customer Support

For technical assistance, troubleshooting beyond this manual, or warranty claims, please contact Dayton Audio customer support through their official website or the retailer from whom you purchased the product. Have your model number (SPA250DSP) and purchase information ready when contacting support.

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