DA850
DA1650

Distribution Amplifiers

Owners Manual

Rev 1.2 | Draft20231009

Table of Contents

Introduction

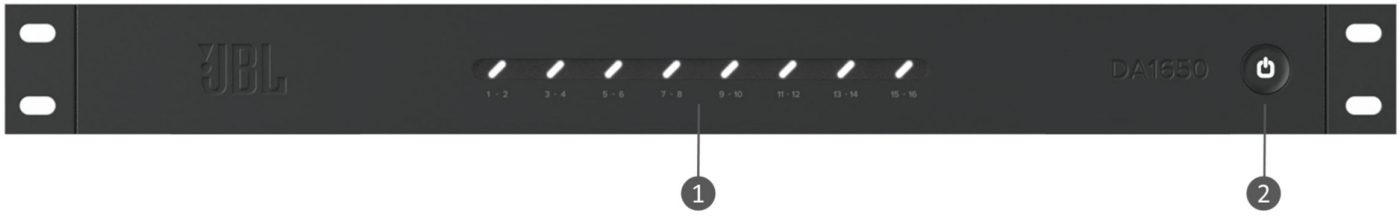
Thank you for purchasing a JBL DA series distribution amplifier. The DA850 and DA1650 amplifiers are designed, engineered, and manufactured to the industry's highest quality standards and offer system integrators with the core features and fundamental connectivity for home audio distribution.

Please take the time to study the owner's manual so that you can obtain the best possible service from your amplifier at http://www.jbl.com/specialty-audio/

What's in the Box

1. JBL DA series amplifier
2. Quick-start guide and safety sheet
3. Phoenix block connectors
4. Removable feet and fastening screws
5. Rackmount brackets and fastening screws
6. Power cord

Front Panel Overview



1 CHANNEL STATUS LED INDICATORS
These LEDs indicate the status of each of the amplifier channel pairs when active.

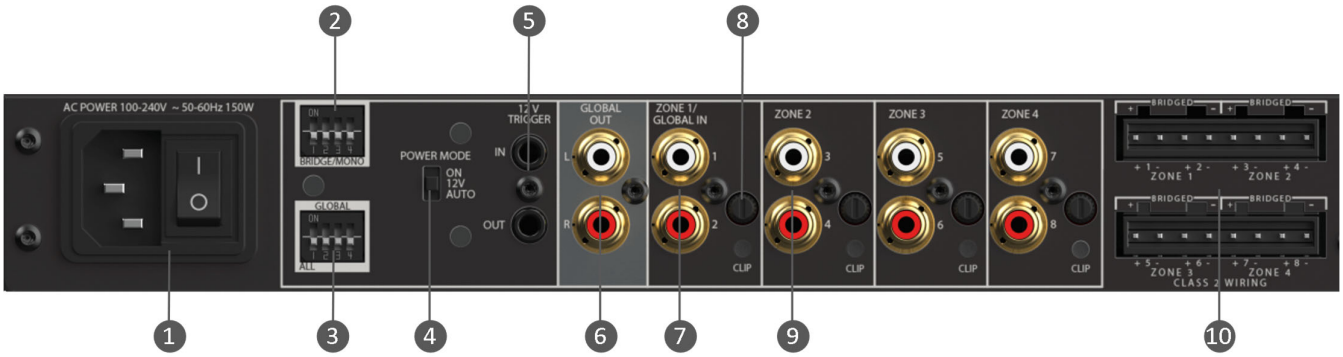
When a channel is active, its LED indicator will glow WHITE. If the channel is in standby, the LED will be off. If clipping is present while playing an input source, the LED will flash YELLOW. If a channel has a fault, the LED will blink RED indicating the presence of a short or some other problem related to that channel pair.

2 STANDBY BUTTON
Activates and deactivates standby mode when the amplifier is connected to AC power.

When the amplifier is connected to AC power, the standby button LED will glow dim BLUE indicating that the unit is in standby mode. In this state, the power amplifier section is not activated and the unit consumes minimal AC power. Pressing the standby button from this state will activate the power amplifier section and the standby button LED will glow WHITE indicating that the amplifier is powered on.

NOTE: If the trigger input is used, it will override the standby button operation

Rear Panel Overview



1 AC POWER INLET AND SWITCH
Connect the included AC power cord to this standard 15A, IEC type inlet. Supported mains voltage range is 100-240V~.

AC power switch disconnects amplifier completely from AC mains.

2 BRIDGE/MONO MODE
Set the switch to the UP position per zone to enable Bridge/Mono Mode.

When Bridge/Mono is enabled for a zone, the Left and Right inputs are summed to mono.

In Bridge/Mono mode, outputs can be used in either Bridge outputs or single channel pairs.

3 LINK TO GLOBAL INPUT
Set the switch to the UP position to link a zone to the ZONE 1 INPUT/ GLOBAL INPUT

4 POWER MODE
ON: Always On

12V: Controlled by 12VDC trigger.

AUTO: Turn on when an audio signal is sensed on the audio input

5 12V TRIGGER IN/OUT
The Trigger In and Out connections provide 1/8" (3.5mm) mono mini-plug connectors.

Use the Trigger In for making connections to external control devices that will activate and deactivate the DA amplifier standby mode. The Trigger Out can be used for making Trigger In daisy-chain connections to additional DA series amplifiers or other components that need to mimic the amplifier's power state.

6 GLOBAL OUT
Provides a line-level RCA connector loop/pass thru output for connecting multiple DA amplifiers in a system utilizing a single Global input signal.

7 ZONE 1 INPUT / GLOBAL IN
Provides a line-level RCA connector input to feed the corresponding speaker-level output channel.

Additionally, this input can also feed any/all speaker output channels by utilizing the LINK TO GLOBAL INPUT switches.

8 OUTPUT LEVEL CONTROLS AND CLIP INDICATOR
Provides output level attenuation per Zone pair.

The output level controls function as attenuators for each zone and can be used to level-match zones in an installation.

The CLIP indicator LED is located below the GAIN control. If clipping is present while playing an input source, the CLIP LED will flash red.

9 LOCAL INPUTS / ZONE INPUTS
Provides a line-level RCA connector input to feed a corresponding speaker-level output channel.

When used as a multi-zone amplifier, each channel can be provided with a dedicated input signal. The signals from this input will only be available on the corresponding speaker-level output.

Local inputs are grouped and identified both by Zone, and channel numbers 1-8 on the rear panel.

10 OUTPUT TERMINAL (PHOENIX BLOCK) CONNECTORS
Two four-pole, touch-proof terminal strip per channel pair. Accepts up to 12 AWG wire or terminal forks.

Installation

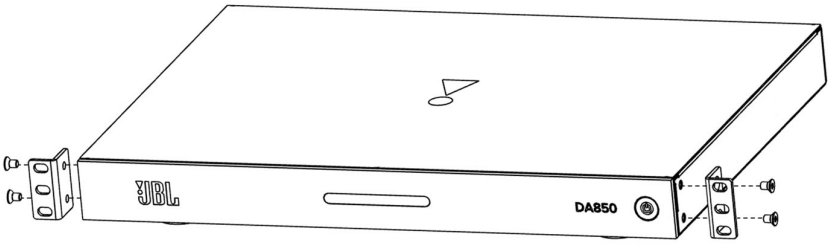
RACK MOUNTING

CAUTION: Before you begin, make sure your amplifier is disconnected from the power source.

The DA series amplifiers are intended to be installed in a standard 19-inch equipment rack with the supplied with rack mount ears in a 1U rack space (rack mount bolts and nuts are not included).

Installing a DA series amplifier in a rack:

1. Attach the rack ear brackets to the sides of the amplifier using the provided machine screw fasteners into the threaded holes (1 ± 0.1Nm recommended torque).

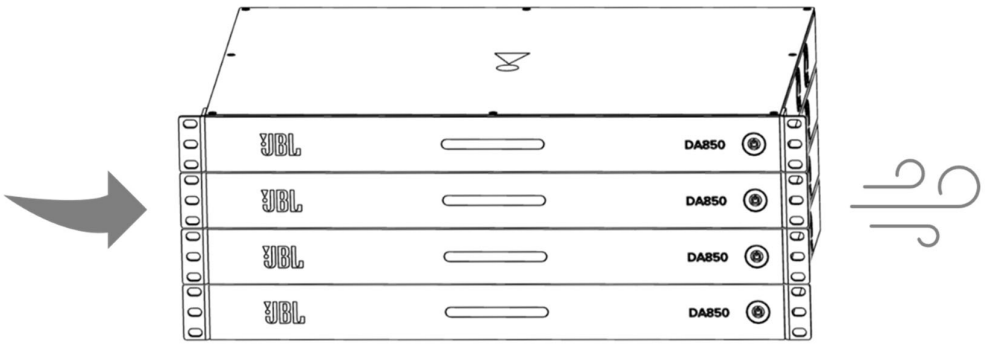


2. Install into rack and connect cabling.

PROPER COOLING

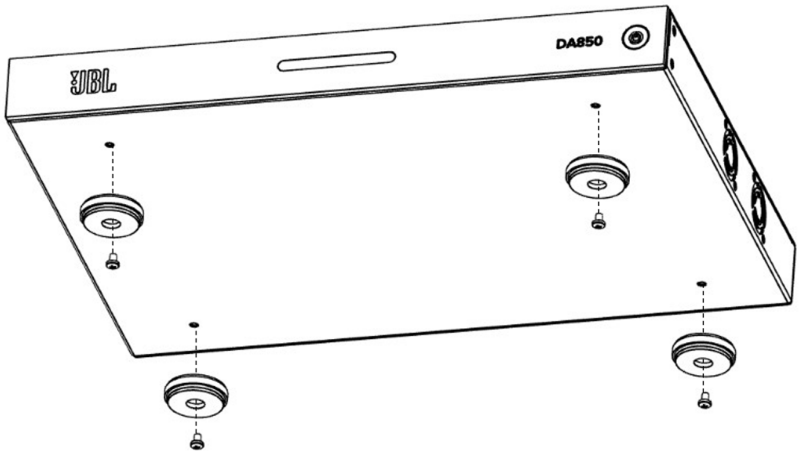
When using an equipment rack, mount units directly on top of each other. Close any spaces in the rack with blank panels. (Open spaces will reduce cooling efficiency.) Once mounted in the rack, ensure the sides of the amplifier are well ventilated and that the fan openings are not obstructed. The rack should be a minimum of 2 inches (5.1cm) away from the sides of the amplifier.

Air flow is side-to-side.



SURFACE MOUNTING

You can also place a single amp on a solid, stable surface utilizing the provided feet and fasteners.



Once positioned, ensure the sides of the amplifier are well ventilated and that the fan openings are not obstructed.

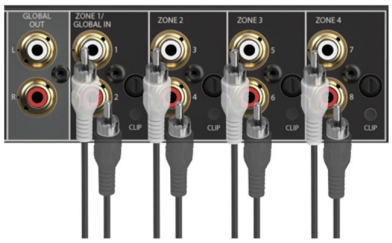
If the system is taken out of use for a long period, disconnect the amplifier from the mains power supply.

Hardware Setup

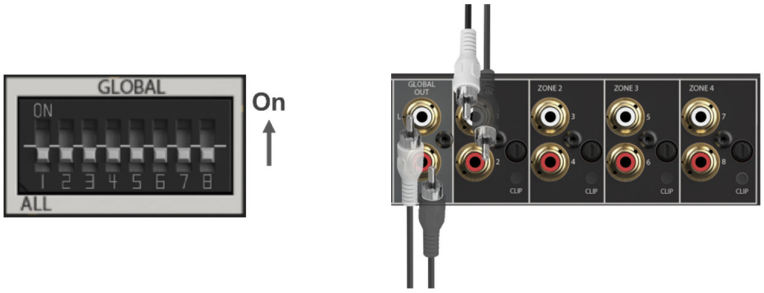
CONNECTING AUDIO INPUTS

JBL recommends using pre-built or professionally wired unbalanced cables (single-ended plus shield). The DA series amplifiers accept line-level audio connections at the RCA input connectors.

When the amplifier is used as a multi-zone amplifier, each channel can be provided with a dedicated input signal. The signal from this input will be available on the corresponding speaker-level output.



Alternatively, each zone can be linked individually to the GLOBAL IN/ZONE INPUT 1.



Local inputs are grouped and identified in pairs, with a shared output level control.

Note that for BRIDGE/MONO operation, a stereo input will be appropriately summed to mono and outputs can be used in either Bridge outputs or single channel pairs.

WIRING OUTPUT CONNNECTORS

Before making any output connections, ensure the power cord is disconnected from the amplifier and carefully review the total impedance for loudspeakers connected to each amplifier output. If multiple loudspeakers are connected to an output (i.e., in series, parallel, or series-parallel), be certain the total system impedance is within the allowed specification for the output. See "Specifications" on page 13 and 14 for supported load specifications.

JBL recommends using two-conductor or four-conductor, heavy gauge speaker wire up to 12 AWG.

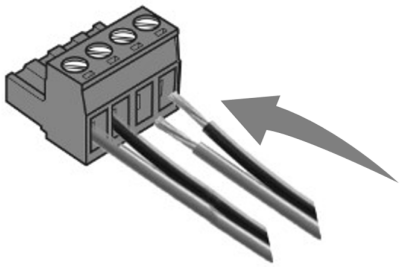
For low-impedance loads, refer to the table below and select the appropriate size of wire based on the distance from amplifier to speaker.

Distance	Wire Size
Up to 25 ft. (7.6m)	16 AWG
26-40 ft. (7.9-12.2m)	14 AWG
>41 ft. (12.5m)	12 AWG

Speaker outputs provide connection for:

- Up to four pair of stereo speakers (eight speakers total) to the DA850
- Up to eight pair of stereo speakers (sixteen speakers total) to the DA1650

Connection to speakers is provided via phoenix-type connectors that accept bare wire terminations. The connectors are grouped in pairs with one connector each for pair. Each pair consists of four wire terminations: positive (+) and negative (–) for the Left channel and positive (+) and negative (–) for the Right channel. To attach speaker cables to the phoenix connector, strip approximately ¼" of insulation off of the end of the positive and negative leads of the cable and insert the bare ends into the corresponding position of the phoenix connector, tightening the screw terminals on top to secure the termination. Repeat this procedure for each speaker.



Do not connect the L – and R – (negative) terminals together. Doing so will result in a fault condition and the amplifier will either shut down or not work properly.

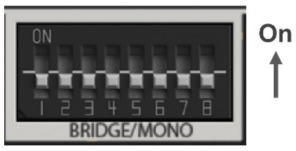
Check the polarity of the speakers and wires prior to connecting to the amplifier.

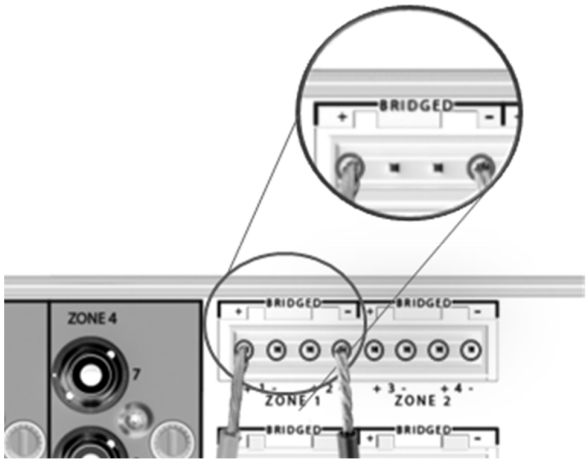
CONNECTING BRIDGED OUTPUTS

1. Set BRIDGE/MONO as needed for each zone by moving the switch to the UP position for that zone.
2. Connect the + terminal from the speaker to the + terminal of the left channel on the amplifier.
3. Connect the – terminal from the speaker to the – terminal of the right channel on the amplifier.

The two terminals for a bridged pair of speakers are marked by + BRIDGED –

In Bridge mode, the pair of amplifier channels in a zone combine to make a mono output of double the power. When in bridge mode the left and right channel RCA inputs to the zone are active so you can connect one mono source (Left) or a stereo source (Left and Right) which will sum-to-mono appropriately.





CONNECTING THE AC POWER CORD

Connect your amplifier to the AC mains power outlet using the supplied AC power cord. First, connect the IEC end of the cord to the IEC connector on the amplifier. Then plug the other end of the cord to the AC mains.

The third (ground) prong of the supplied AC power cord connector is a required safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.

Make certain the AC mains voltage and current ratings are sufficient to deliver full power to all amplifiers. DA Series amplifiers use a universal power supply. The AC voltage requirements are 100V-240V~, 50/60Hz (±10%). If the AC line voltage varies outside of this acceptable range, the amplifier's power supply will turn off and the standby LED will flash RED. The amplifier will turn back on when the AC line voltage returns to safe operating levels.

POWER UP PROCEDURE

When turning on the amplifier for the first time:

1. Connect the power cord and turn on the amplifier power using the rear AC mains rocker switch.
2. Press the front standby button to power the unit out of standby.
3. Turn your audio source up to an optimum level. If any of the amplifier's Clip indicators light RED, reduce the source level until the Clip LEDs no longer light.

IMPORTANT: Always turn off the amplifier — by using the rear AC mains rocker switch — and disconnect the power cord before making any wiring or installation changes.

PRECAUTIONS

Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Configure the amplifier for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating difficulties.
2. Use care when making connections, selecting signal sources, and controlling the output level.
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.

Never connect the output to a power supply, battery, or power main Electrical shock may result.

4. Tampering with the circuitry or making unauthorized circuit changes may be hazardous and invalidate all agency listings.
5. Do not operate the amplifier with the Clip LEDs constantly flashing.
6. Do not overdrive the preamplifier/source, which will cause clipped signal to be sent to the amplifier. Such signals will be reproduced with extreme accuracy, and loudspeaker damage may result.
7. Do not operate the amplifier with less than the rated load impedance. Due to the amplifier's output protection, such a configuration may result in premature clipping and speaker damage.

REMEMBER: JBL/ HARMAN is not liable for damage that results from overdriving other system components.

Setting POWER MODE

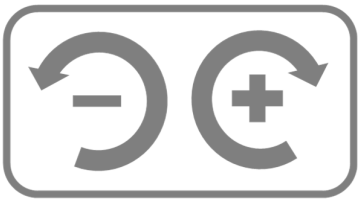
The three-position POWER MODE switch has three settings:

ON:	Front panel standby button activates and deactivates standby mode when the DA amplifier is connected to AC power. When the amplifier is connected to AC power, the standby button LED will glow dim BLUE indicating that the unit is in the standby mode. In this state, the power amplifier section is not activated, and the unit consumes minimal AC power. Pressing the standby button from this state will activate the power amplifier section for all zones and the standby button LED will light up WHITE indicating that the DA is powered on.
12V:	Enables control for remote 4.5V-12VDC trigger signals used to activate and deactivate the standby mode of the amplifier. The Trigger In and Out connections can be used to activate and deactivate the standby mode from devices such as remote control systems, preamplifiers or other external devices. The Trigger In and Out connections offer 1/8" (3.5mm) mono mini-plug connectors. Use the Trigger In for making connections to external control devices that will activate and deactivate the DA amplifier standby mode. The Trigger Out does not provide DC power on its own but can be used for making Trigger In daisy-chain connections to additional DA series amplifiers or other components that need to mimic the amplifier's power state. **NOTE:** When a remote trigger is connected it will override the front panel standby button operation. **To install a trigger cable:** • Power the controlling source and DA amplifier off. • Connect the trigger cable to the controlling source and the DA amplifier. • After the connections are made, power on the controlling source and the DA amplifier. After the source unit is fully powered up, the LED power indicator on the front of the amplifier should be lit WHITE. • Verify the trigger is working by putting the source unit into standby mode. The DA amplifier after a short delay will also go into the standby mode and the power indicator will light up dim BLUE. • Once you have verified that the trigger cable is working, only use the source unit to power on and off your DA series amplifier.
AUTO:	Enables the audio Signal Sense circuitry for the Global and Local inputs. The Signal Sense circuitry allows the amplifier to activate a zone when an audio signal is detected at the corresponding input and deactivate a zone when no audio signal has been present for 30 minutes. When the amplifier is powered on and the Power Mode switch is set to the Auto position, amplifier channels with signal present will be active. Channels without signals present will remain switched off until signals are detected. In this mode, power consumption is lowered by switching off idle channels and audio performance is improved by eliminating crosstalk on adjacent unused channels. In cases where Auto is enabled and no audio signals are present on any channels for more than 30 minutes, all channels will be switched off and only the front panel standby button will slowly flash dim BLUE while the amplifier continues to monitor all inputs for a signal. **NOTE:** When a remote trigger is connected it will override the front panel standby button operation.

Output Level controls

ADJUSTING OUTPUT LEVELS AND CLIP INDICATION

Output levels are controlled per channel pair using the attenuation knobs located next to the Zone inputs on the rear panel. The output level controls function as attenuators for each zone and can be used to level-match zones in an installation. When turned fully clockwise, the output level is at maximum. The CLIP indicator LED is located below the Level control. If clipping is present while playing an input source, the CLIP LED will flash red. To operate the output level control, use a small, flat-tipped screwdriver to rotate the controls knob so that the desired level is achieved and without clipping.



LED Status

POWER LED

LED	Status
Dark/Unlit	Off
White	On
Dim Blue	Standby
Dim Blue (slowly breathing)	Standby in Auto Power Mode
Red	PSU Fault

ZONE STATUS LED

LED	Status
Dark/Unlit	Off/Signal not present
White	On/signal preset
Yellow	Clipping
Red	Zone Fault

Specifications

DA850

Connectivity and Control	
Analog audio input	8 x RCA (Single Ended)
Stereo analog global output (global input looped to global output)	2 x RCA (Single Ended)
Speaker output	Phoenix block connectors, accommodates up to 12AWG wire
12V trigger control	1 x 3.5mm (in) 1 x 3.5mm (out)
Power	Standard IEC
Global input select	4 x 2-position dip switches
Bridge/Mono select	4 x 2-position dip switches
Power Mode select	1 x 3-position switch – always on, 12V, auto sense
Power (1kHz, 20ms burst, 2 channels driven, 0.5% THD max)	
Rated Power (8Ω)	50W
Rated Power (4Ω)	110W
Rated Power (8Ω Bridged, one zone driven)	185W
Performance	
Frequency Response	20Hz-20kHz +/-0.5dB, at 1/8th power, all loads
THD+N (max), at rated power, 20-20kHz	<0.1%
Signal to noise ratio (min), A-weight, 20-20kHz, 8Ω mode	>100dB
Crosstalk between any zones, at 1/8th power	-80dB
Minimum output impedance	2.7Ω
Analog input impedance	20kΩ
Signal sense, wake up level	1.75 mVrms
Max. undistorted analog input signal	4.6 Vrms
Fan noise, maximum, 1/8 power	50dBA SPL @ 1 meter
Electrical	
Power supply	Universal Mains 100–240VAC 50-60Hz
Standby power consumption	Less than 0.5W
Physical	
Max. ambient temperature	113°F (45°C)
Max. operation altitude	9843ft (3000m)
Dimensions (H x W x D):	1.7” x 17.2” x 12.7” (43.7mm x 436.0mm x 323.0mm)
Dimensions inc. feet (H x W x D):	1.75” x 17.2” x 12.7” (44.5mm x 436.0mm x 323.0mm)
Net Weight:	4.5kg

DA1650

Connectivity and Control	
Analog audio input	16 x RCA (Single Ended)
Stereo analog global output (global input looped to global output)	2 x RCA (Single Ended)
Speaker output	Phoenix block connectors, accommodates up to 12AWG wire
12V trigger control	1 x 3.5mm (in) 1 x 3.5mm (out)
Power	Standard IEC
Global input select	8 x 2-position dip switches
Bridge/Mono select	8 x 2-position dip switches
Power Mode select	1 x 3-position switch – always on, 12V, auto sense
Power (1kHz, 20ms burst, 2 channels driven, 0.5% THD max)	
Rated Power (8Ω)	50W
Rated Power (4Ω)	110W
Rated Power (8Ω Bridged, one zone driven)	185W
Performance	
Frequency Response	20Hz-20kHz +/-0.5dB, at 1/8th power, all loads
THD+N (max), at rated power, 20-20kHz	<0.1%
Signal to noise ratio (min), A-weight, 20-20kHz, analog input, 8 Ω mode	>100dB
Crosstalk between any zones, at 1/8th power	-80dB
Minimum output impedance	2.7Ω
Analog input impedance	20kΩ
Signal sense, wake up level	1.75 mVrms
Max undistorted analog input signal	4.6 Vrms
Fan noise, maximum, 1/8 power	50dBA SPL @ 1 meter
Electrical	
Power supply	Universal Mains 100–240VAC 50-60Hz
Standby power consumption	Less than 0.5W
Physical	
Max. ambient temperature	113°F (45°C)
Max. operation altitude	9843ft (3000m)
Dimensions (H x W x D):	1.7” x 17.2” x 12.7” (43.7mm x 436.0mm x 323.0mm)
Dimensions inc. feet (H x W x D):	1.75” x 17.2” x 12.7” (44.5mm x 436.0mm x 323.0mm)
Net Weight:	4.5kg

Troubleshooting and Maintenance

Troubleshooting

The amplifier does not power on.

1. Attempt to power on the amplifier with the front panel Standby/On button.
2. Examine the power cord to ensure a good connection between the rear panel AC input connector and the wall outlet.
3. Check the wall outlet.

The Trigger Input is connected to an external device, but the amplifier does not power on and off with the external device.

1. Verify the trigger cable is connected at both ends and verify that the trigger cable is connected to the right device. Also re-verify the trigger installation as instructed in the Hardware Setup section of this user guide.
2. Verify the trigger level of the output source device. The DA accepts a range of 4.5-15VDC.

Source signals are present and the system is at a suitable volume level but one or more channels are not passing audio.

1. Reduce system volume level.
2. Power the DA into standby mode.
3. Check input connections.
4. Check speaker connections.
5. Allow the amplifier to cool before powering it on again.

Audio sounds “thin” and is lacking proper bass response.

Check to ensure proper polarity of the speaker cables and connections.

Audio Levels differ between zones.

1. Check the level settings of the DA Output Level Controls.
2. Check the settings on your preamp, processor or controller.

Audio plays and then cuts off.

Check input and speaker connections for short circuits or loose connections at the amplifier and speaker.

A humming sound is present in the audio.

Audible hum, or a discernable low frequency noise is one of the most common problems within audio/video systems. This problem, even when the volume is at a low level, is usually caused by a common problem known as a “ground loop”. A ground loop occurs when there is a difference in ground voltages between two or more components that are connected electrically. In most cases, one or more of the following suggestions below will solve the hum problem.

1. Disconnect components one at a time to isolate the problem. Once the problem is identified, make sure the associated component is properly grounded and connected to the same electrical ground as the DA amplifier.
2. Turn off all components within your system and then disconnect the input cables on the DA amplifier. Turn the amplifier back on. If the hum disappears the fault may be with the input cables that are being used. Make sure the cables are properly shielded or use a cable that has better shielding. Make sure the cable is not running or laying on top of any AC power cords.
3. Ground loop problems may also be caused by poor grounding of the electrical system within your home or may be caused by faulty earth grounds in your home’s electrical system. To isolate the problem, try unplugging components with three prong grounded power cords one at a time to see if one or all are causing the problem. Please check with a licensed electrician for further evaluation.

If all else fails…

1. Contact an authorized JBL dealer.
2. Contact JBL Customer Technical Support

Maintenance

Routine maintenance should be performed on a periodic basis. Clean the exterior surfaces of the unit with a soft, dry, lint-free cloth. Do not use alcohol, benzene, acetone-based cleaners, or strong commercial cleaners. Do not use a cloth made with steel wool or metal polish. If the unit is exposed to a dusty environment, a low-pressure blower may be used to remove dust from its exterior.

Harman International Industries, Incorporated.
8500 Balboa Blvd, Northridge CA 91329 United States.

European Representative: Harman International Industries, Incorporated.
EMEA Liaison Office, Danzigerkade 16G, 1013 AP Amsterdam, The Netherlands.

UK Business Address: Ground Floor, Westside 2, London Road, Apsley, Hemel Hempstead, Hertfordshire, HP3 9TD, United Kingdom.