DECADE™

AMPLIFIERS DA4002, DA6502, DA3504, DA1002



GENUINE JBL

Thank you for purchasing your new JBL Decade™ Series power amplifier. Decade Series power amplifiers feature the latest advances in discrete circuit topology ensuring low distortion and superbly clean and clear sound quality. In addition to RCA-type pre-amp inputs, Decade Series amplifiers feature Floating Ground Factory-Head-Unit Interface,™ designed to facilitate integration with factory-installed audio systems for distortion-free performance. All JBL Decade Series power amplifiers feature built-in electronic crossovers for easy system expansion without additional outboard processors.

Amplifier Features

- 4-, 3- or 2-channel operation (DA3504) 2- or 1-channel operation (DA4002, DA6502, DA1002)
- Simultaneous stereo and mono operation
- Built-in 12dB/oct electronic crossover
- Oversized Floating Rail Mosfet Power Supply
- Floating Ground Factory-Head-Unit Speaker-Level Input
- Variable input sensitivity (250mV-4V)
- Fully complementary output stage with Class-A voltage amplification
- Gold-plated power, input and output connectors
- 2-Ohm stable (stereo)
- Power-on indicator badge

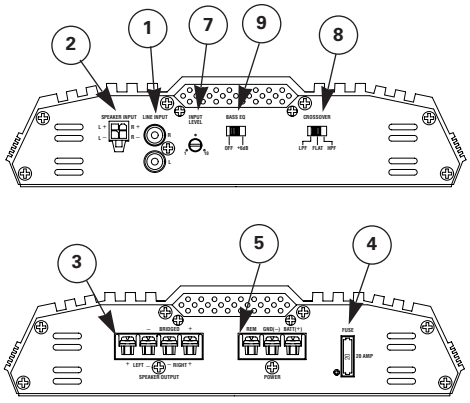
About This Manual

To attain maximum amplifier performance, we encourage you to read the remaining pages before installing and operating your new JBL Decade power amplifier. Especially review the Applications section for ideas on designing and expanding your system. Also, save these instructions for future reference.

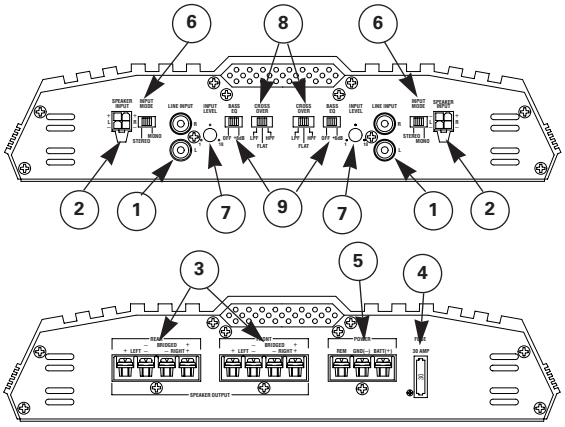
Important: Installation of automotive stereo components can require extensive experience in performing a variety of electrical and mechanical procedures. Although these instructions explain how to install a JBL Decade power amplifier in a general sense, they do not show the exact installation methods for your particular vehicle. If you do not have the experience, do not attempt the installation yourself; instead ask your Authorized JBL Car-Audio Dealer about professional installation options.

Installation Precautions and Notes

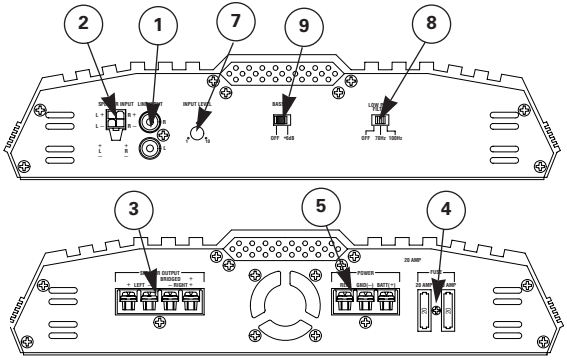
- The JBL Decade Power amplifiers have five levels of circuit protection that monitor the amplifier and will shut it down if the electrical system voltage drops below 5Vdc or exceeds 18Vdc, temperatures are above 194° F (90° C), short circuits occur or current draw exceeds product specifications. For best performance, check the intended mounting site to make sure the operating environment does not create conditions that will trigger circuit protection.
- Prior to installation, turn off all audio systems and other electrical devices. Also disconnect the (–) negative lead from the vehicle's battery.
- At the installation site, locate and make a note of all fuel lines, hydraulic brake lines and electrical wiring. Use extreme caution when cutting or drilling in and around these areas.
- Check clearances on both sides of a planned mounting surface before drilling any holes or installing any screws. Remember that mounting screws can extend behind the mounting surface.
- Always wear protective eyewear when using tools.
- When routing cables, keep input signal cables away from power cables and speaker wires.
- When making connections, make sure that each connection is clean, insulated, and properly secured. Observe the polarity markings on the rear panel. Refer to the application drawings to set up the amplifier for operation in stereo, bridged-mono, bi-amp or tri-mode configurations.
- If the amplifier's fuse must be replaced, use only the same rating and type as a replacement. Do not substitute another kind.



DA4002/DA6502



DA3504



DA1002

Controls and Connectors

1. Pre-amp Line Level Input Connector – Connects to line-level output from the source unit.
2. Floating Ground Factory-Head-Unit Interface Speaker Input – Connects to speaker level output from the source unit (2-channel on DA4002, DA6502, DA1002; 2 separate 2-channel connectors on DA3504).
3. Speaker-Output Connector – 2-channel on DA4002, DA6502 and DA1002; 4-channel on DA3504.
4. Fuse – DA4002: 15A ATC, DA6502: 20A ATC, DA1002 2x 20A ATC, DA3504: 30A ATC.
5. Power Connector – Connection for 12V+, Gnd and Rem in.
6. Input-Mode Switch – Sums left and right inputs.
7. Input-Level Control – Adjusts input sensitivity for pre-amp level and speaker level inputs.
8. Crossover Selector – Determines whether the crossover is a High-Pass filter @120Hz (HP), a Low-Pass filter @120Hz (LP) or unfiltered (FLAT). Low-pass filter frequency selector (DA1002).
9. Bass E.Q. – Enables bass boost +6dB @ 50Hz.

Mounting the Amplifier

The JBL Decade Series amplifiers can be mounted in virtually any location inside the vehicle. However, make sure to keep the amplifier away from heater vents or ducts.

1. At the chosen site, use the amplifier as a mounting template and mark the locations of the four mounting holes.
2. Drill a small pilot hole at each marked location.
3. Mount the amplifier and securely tighten the mounting screws.

Wiring the Power Connections

Refer to diagrams on page 3 for connector locations.

1. For power, remote and speaker wires, strip 1/4" off one end of each jacket to reveal bare wire for insertion into the barrier strip connectors.
2. Locate the 3-connection barrier strip labeled +Batt, Rem and Gnd. Connect a black wire (at least 12G for DA4002, 10G for DA6502, DA1002 and DA3504) to the Gnd terminal and connect the other end to the nearest bare-metal chassis component. Then, connect a red wire (at least 12G for DA4002, 10G for DA6502, DA1002 and DA3504) from the vehicle's +12-volt battery terminal to the +Batt terminal on the barrier strip. Finally connect a blue wire (16G) to the Rem terminal on the barrier strip and connect the other end to the Rem output of the source unit.

Wiring the Speaker Output Connections

1. Connect the speakers, observing proper polarity, to the speaker output barrier strip on the amplifier using at least 16G high-quality speaker wire. (Note: The total impedance of the speakers connected to the outputs when the amp is driven in stereo must be at least 2 ohms.)
2. If you are bridging the amplifier, connect the speaker wires to the terminals marked "bridge", observing proper polarity. (Note: The total impedance of the speaker system to be connected to the amplifier must be at least 4 ohms in bridge mode.)
3. If you are running the amp in Tri-Mode (stereo and mono simultaneously to one or two pairs of satellite speakers and a subwoofer), refer to the chart below to determine the capacitor and inductor values you'll need to route bass signals to the woofer, and midrange and high frequencies to the satellite speakers. These passive crossover components will also ensure that the impedance of the speaker system doesn't drop below 2 ohms.

FREQUENCY Crossover	INDUCTOR 6dB/oct. LP (4 ohm)	CAPACITOR 6dB/oct. HP (4 ohm)
75Hz	8.0mH	530µF
100Hz	6.4mH	400µF
125Hz	5.0mH	318µF
150Hz	4.2mH	265µF
175Hz	3.6mH	227µF
200Hz	3.2mH	198µF

Wiring the Input Connections

1. If you are using conventional RCA input connections and a source unit with output voltage less than 4V, simply plug the RCA plugs into the RCA jacks on the amplifier.
2. If you are connecting the amplifier to a factory-installed source unit, or to a source unit that only has speaker-level outputs, connect the speaker outputs of the source to the speaker input plug on the amp using the connector provided.

Observe the following color-codes:
Left+: White
Left–: White with black stripe
Right+: Gray
Right–: Gray with black stripe

4. If you are connecting your Decade Series amplifier to a source unit with output voltage higher than 4V, connect the output signal wires of the source unit to the floating ground factory head unit inputs. Because the inputs have an impedance of 100K ohms, this connection will provide the best noise-free performance possible.

System Setup and Adjustment

Electronic Crossover

The electronic crossover(s) in your Decade Series amplifier can be selected as a 12dB/oct. high-pass filter at 120Hz (HPF), a 12dB/oct. low-pass filter at 80Hz (LPF) or it can be defeated (FLAT).

Setting Input Sensitivity

Proper input sensitivity control settings on Decade Series power amplifiers are critical to ensure optimum performance, low noise levels and maximum system reliability. As a general rule, controls at the front end of a system (source, equalizers and other processors) should be set as high as possible with the amplifier input sensitivity set as low as possible while still providing adequate volume levels. Using a high signal level and a low sensitivity setting will help keep background noise in the system to a minimum.

Initially, turn the input sensitivity GAIN control to its minimum (counter-clockwise) position.

1. Reconnect the (–) negative lead to your vehicle's battery. Apply power to the audio system and play a favorite music track from a CD or tape. (Note: After the source unit is on, the JBL badge (on the top panel) will illuminate, indicating the amplifier is on. If not, check the wiring, especially the remote connection from the source unit. Also refer to "Troubleshooting" on page 7.)
2. On the source unit, increase the volume control until it is approximately 3/4 of its maximum output level. Slowly increase the Input Sensitivity control (clockwise) toward three o' clock and, at the same time, listen to the quality of the reproduced sound.

At some point, you'll hear distortion on the music peaks. Stop the adjustment and turn it back slightly. This is the maximum undistorted output level of your system, and should not be exceeded during use.

3. After adjusting the level of the main speakers in your system, you should adjust the remaining channels (if you are using a DA3504 or a multi-amp system) for the desired system balance. You'll find this easiest to do by adjusting the channels in the following order: 1) front speakers, 2) rear speakers, 3) subwoofer. Elaborate, multi-channel systems may be too complex to adjust. Your local JBL installation specialist is the best person to help with such adjustments.

Applications

For your convenience, we've included several application diagrams to help you plan your own system installation. Figures 1 through 4 show how to configure the Decade Series power amplifiers for stereo, bridged-mono and tri-mode operation.

(Note: For simplicity, figures do not show power, remote and input connections.)

Figure 1. This wiring diagram shows a DA4002, DA6502 amplifier set to stereo to drive a pair of full-range speakers.

Figure 2. This wiring diagram shows a DA1002 amplifier set to bridge mode (mono) to drive a single subwoofer.

Figure 3. This wiring diagram shows a DA4002, DA6502 amplifier set for tri-mode operation. For a desired crossover frequency, use the chart on page 4 to select an inductor for the subwoofer, and corresponding capacitors for left and right speakers.

Figure 4. This wiring diagram shows a DA3504 set to drive a pair of 5-1/4" 2-way speakers with the two front channels, and the rear channels set to drive a single subwoofer in bridge mode.

Figure 1

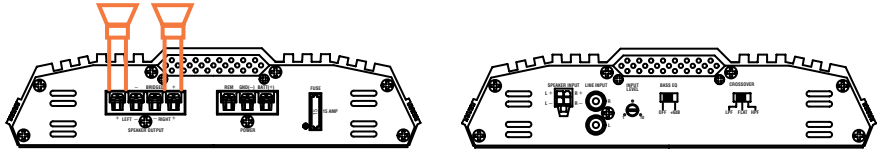


Figure 2

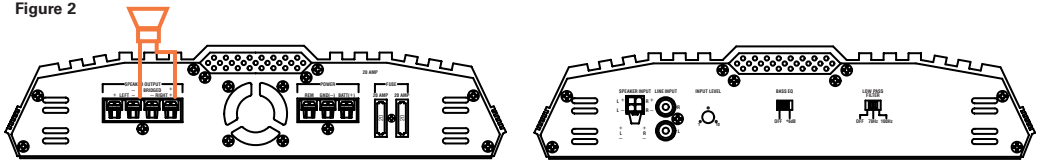


Figure 3

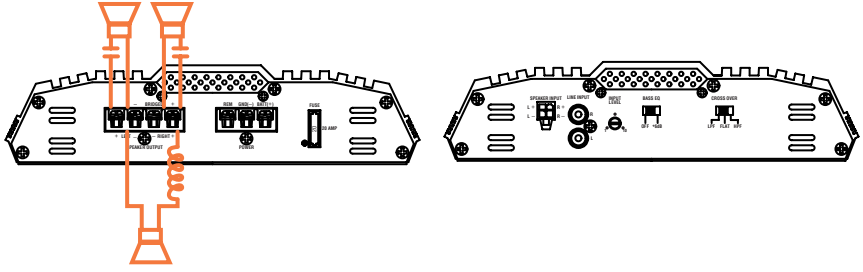
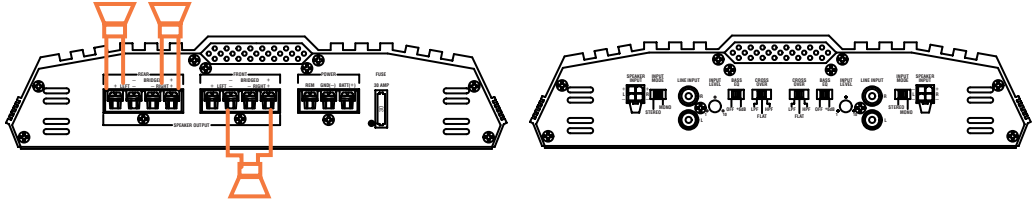


Figure 4



Troubleshooting

Use the following guide to identify symptoms and solve problems. Make sure the vehicle's electrical system is working properly and power is reaching the amplifier's power connector.

Symptom	Likely Cause	Solution
No audio	Low/no remote on voltage	Check connections; turn-test turn-on voltage
	Speakers are not connected or are blown	Check wiring; use VOM/DVM to measure speaker coil resistance
Distorted audio	Input sensitivity is not set properly	See Setting Input Sensitivity on page 5
Audio lacks "punch"	Speakers are wired with wrong polarity	Check polarity of connections; refer to Applications
Audio cycles off and on; amber protection LED (JBL badge on top panel) is not lit	A protection circuit is turning amplifier off and on	Verify the following: off electrical system is between 5 ~ 18 Vdc; temperature is not over 194°F (90°C); no short circuits; speaker loads are not less than 2 ohms (4 ohms in mono)
Audio cycles off and on; amber protection LED (JBL badge on top panel) is not lit	GAIN is set too high	Set Input Sensitivity correctly (see page 5)
Fuse blows	Incorrect wiring or short circuit	Check connections; refer to Applications

Declaration of Conformity

CE

We, JBL Europe A/S
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DK-3460 Birkerød
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declare in own responsibility, that the products described in this owner's manual are in compliance with technical standard:

EN 55 020/6.1988

Steen Michaelsen
JBL Europe A/S
Birkerød. DENMARK. 3/98

Specifications

DA4002, DA6502, DA1002, DA3504

Specifications	DA4002	DA6502	DA3504	DA1002
Power Output, 4 ohms:	2 x 40 watts	2 x 65 watts	4 x 35 watts	2 x 100 watts
Power Output, 2 ohms:	2 x 50 watts	2 x 75 watts	4 x 50 watts	2 x 150 watts
Power Output, Bridged 4 ohms:	100 watts	150 watts	2 x 100 watts	300 watts
Frequency Response:	20Hz ~ 20kHz +1dB, –2d	20Hz ~ 20kHz +1dB, –2dB	2 Hz ~ 20kHz +1dB, –2dB	20Hz ~ 20kHz +1dB, –2dB
Input Sensitivity:	250 mV ~ 4V	250 mV ~ 4V	250 mV ~ 4V	250 mV ~ 4V
THD + Noise (4 ohms):	0.1 %	0.1 %	0.1 %	0.1 %
Signal-to-Noise:	>90dB	>90dB	>90dB	>90dB
Maximum Current Draw:	18A	14A	34A	32A
Dimensions (W x H x L):	9-5/8" x 2-1/4" x 8-1/4" 244 x 57 x 210mm	9-5/8" x 2-1/4" x 9-3/4" 244 x 57 x 248mm	11-5/8" x 2-9/16" x 11-7/8" 295 x 65 x 300mm	11-5/8" x 2-9/16" x 11-5/16" 295 x 65 x 290mm

JBL Consumer Products
250 Crossways Park Drive
Woodbury, NY 11797
www.jbl.com

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