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CE

INTRODUCTION

Ref Four - Making the heritage appear clearly. Overdimensioned products can be applied in a wide range of configurations, even those not intended at first. We have always taken great pride in meticulous R&D to provide premium products, but it has also been a misconception that B2 audio products might not have been designed with SQ as a cornerstone.

The Ref Four is a statement to show the contrary. It took numerous prototypes and revisions to ensure it would be catering to the purists. Thus the profile of the amp is also more conservative, but that can't be said for what's inside. An amp witout compromise with only dynamics, headroom and SQ in mind. Reveered component manufacturers such as Mcap, Nichicon, Burr Brown & IR have been used to fullfil the SQ.

To obtain the full potential of the amplifier and to minimize failure, it is strongly recommended & necessary to upgrade the stock electrical system. Ensure the system is in accordance with the full performance of the amplifier, it is therefore essential to read through the entire manual.

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Better Bass

BETTER BASS IS OUR PHILOSOPHY OF ADDING SOMETHING EXTRA. KEEP IN MIND THAT CONTINIOUS EXPOSURE TO SPL ABOVE 100 DB CAN SERIOUSLY DAMAGE YOUR HEARING. TODAY'S HIGH POWER AUTO SOUND SYSTEMS CAN EASILY PRODUCE SPL OVER 140 DB. ENJOY YOUR MUSIC WITH SENSE.

TABLE OF CONTENTS

| DESIGN FEATURES | 3 | SPEAKER WIRING | 7 |
|---------------------|-------|----------------------|----|
| PANEL LAYOUT | 4 - 5 | *PREPARATIONS | 7 |
| INSTALLATION | б | *STEREO WIRING | 8 |
| *PREPARATIONS | В | *BRIDGED WIRING | 8 |
| *POWER CONNECTORS | 8 | TROUBLESHOOTING | 9 |
| *REMOTE & RCA INPUT | а | WARRANTY INFORMATION | 10 |
| | | | |

DESIGN FEATURES

CIRCUIT CONFIGURATION: FREQUENCY RESPONSE: SIGNAL TO NOISE RATIO: INPUT SENSITIVITY: INPUT IMPEDANCE: LOW PASS CROSSOVER: HIGH PASS CROSSOVER: BAND PASS CROSSOVER: TOTAL HARMONIC DISTORTION: FUSE RATING: POWER TERMINAL GAUGE: DIMENSIONS: Ref Four CLASS A > CLASS AB (BIAS) 10 HZ - 30 KHZ > 95 DB 8 V - 0.1 V 47 KOHM 40 HZ - 4 KHZ 40 HZ - 4 KHZ 40 HZ - 4 KHZ (0.15% (1 KHZ) 120A (3 X 40A) 4 GA 15.35" X 8.64" X 2.56" / 390 MM X 219.5 MM X 65 MM

All features are subject to change in the continuing effort to improve the products without notice.

SPECIFICATIONS

CONTINIOUS OUTPUT POWER (RMS)

| | (12.5 V < 0.2% THD) | (13.8 V < 0.2% THD) | (14.4 V < 1 % THD) |
|----------------------------|---------------------|---------------------|--------------------|
| POWER @ 4 Ω: | 75 W X 4 | 100 W X 4 | 125 W X 4 |
| POWER @ 2 Ω: | 135 W X 4 | 180 W X 4 | 225 W X 4 |
| POWER @ 1 Ω: | 190 W X 4 | 265 W X 4 | 325 W X 4 |

DESCRIPTION OF SPECIFICATIONS

Stable impedance load of the Ref Four is 1 Ohm stereo or 2 Ohm bridged. Operation below minimum impedance will stress the amplifier & void the warranty. Excessive heat will also appear at a faster rate and the and the amplifier will go into thermal protection.

Protection can also be caused by the following

- * Speaker overload
- * Short circuit
- * Input Voltage RCA & Power Supply

Operational voltage 11 V - 15 v.

Operational voltage will also be affected by the load of the amplifier.

*In order to get the full power output of the amplifier, it is crucial that your electical system is correctly (over)dimensioned.

REF FOUR



FRONT SPEAKERS

Speaker connection in stereo or bridge for the front speakers. Ensure polarity is correct.

SQ SELECTION

Bias setting of the amplifier. When pressed, the amplifier will emulate a class A mode. Unpressed it will be class A/B. To fine tune your SQ system, try both modes.

LOW PASS - FRONT CHANNELS (40 HZ-4 KHZ)

Low pass crossover with 24 dB slope per octave.

HIGH PASS - FRONT CHANNELS (40 HZ-4 KHZ)

High pass crossover with 24 dB slope per octave.

BAND PASS - FRONT CHANNELS (40 HZ-4 KHZ)

Using low pass and high pass crossovers at the same time creates an adjustble band pass crossover from 40 Hz to 4 KHz.

LEVEL

Gain setting to match the source unit, adjustable from $0.1 \text{ V} \sim 8 \text{ V}$ input. Remember it is not a volume control!

FRONT INPUTS

Rca input signal from source unit routed to front channels. Left & right input relates to the speaker output.

POWER / PROTECT

Power led lit, amplifier is on, protect led lit, amplifier has gone into protect mode, read the troubleshooting.

REAR INPUTS

Rca input signal from source unit routed to rear channels. Left & right input relates to to the speaker output.

LEVEL

Gain setting to match the source unit, adjustable from $0.1 \text{ V} \sim 8 \text{ V}$ input. Remember it is not a volume control.

HIGH PASS - FRONT CHANNELS (40 HZ-4 KHZ)

High pass crossover with 24 dB slope per octave.

LOW PASS - FRONT CHANNELS (40 HZ-4 KHZ) Low pass crossover with 24 dB slope per octave.

BAND PASS - FRONT CHANNELS (40 HZ-4 KHZ)

Using low pass and high pass crossovers at the same time creates an adjustble band pass crossover from 40 Hz to 4 KHz.

SQ SELECTION

Bias setting of the amplifier. When pressed, the amplifier will emulate a class A mode. Unpressed it will be class A/B. To fine tune your SQ system, try both modes.

REAR SPEAKERS

Speaker connection in stereo or bridge for the rear speakers. Ensure polarity is correct.

POWER IN

Power cable input, Batt + is for 12 V positive from the battery. Remote is for switched remote, used to turn on the amplifier. Gnd is for the ground cable connected to chassis or battery, (closed system).

REF FOUR



BATT+ (POWER CONNECTION)

Connects to the positive terminal of the battery. For specified performance 4 Ga cable is required. Fuses shall be placed within 8" / 20 cm of the battery.

GND (REMOTE)

Connects to the vehichle's chassis. Keep as short as possible (< 20" / 50 cm). Use minimum 4 Ga cable for optimal conditions.

REMOTE

Connects to switched +12 V from the source unit.

We recommend to use minumum10 Ga speaker cables to acquire the intended performance. Run the speaker cables from your speakers to the amplifier's mounting location. Ensure these are ran separately and away from high current cables and if possible the RCA cables as well. In all cases where cables are penetrating the vechile's chassis use grommets to protect the cable.

Connect the speaker wires according to the terminals on the speaker(s).

Strip 3/8" / 1 cm of insulation of the end of each cable and twist the cable strands together tightly. Make sure there are no stray strands that could touch other cables or terminals as it can cause a short circut. Crimp spade plugs over the end of the cable or tin the ends with solder to provide a solid terminal. Connect the cable ends to the amplifier as shown in the diagram.

INSTALLATION OF THE AMPLIFIER SHALL BE DONE IN THE FOLLOWING STEPS:

1. Connect the +12V wire, keep in mind this wire has to be fused at the battery as well. 2. Ensure the ground is appropriate, then connect it to the amplifier. 3. Connect the switched remote. 4. Reattach negative wire (ground) to the battery. 5. Operation over 15V will cause the amplifier to go into protect & can void the warranty!

INSTALLATION CONSIDERATIONS

If you choose to install the amplifier by yourself, please read the entire owner's manual carefully. Before you start your installation, please take all steps into consideration. If in doubt, please go to www.b2audio.com for authorized distributors / dealers that will be able to configure your set up & ensure the warranty of your amplifier.

PREPARATION

Disconnect the negative (-) battery cable before mounting or making any connection. Check the battery & alternator ground (-) connection. Make sure they are properly connected/dimensioned & free of corrosion. Before selecting a mounting location for the amplifier, please take cooling & safety into consideration. Avoid areas with excessive vibration & up side down installation!

In order to avoid excessive heat from the amplifier, it is recommended to find a mounting location that allows for vertical positioning of the heatsink fins. For safety purposes, install the amplifier in a dry and well ventilated location and make sure no cables or other harness of the car is interfaced with the mounting location or will present a hazard to the car's cable, control cables, fuel lines/tanks, hydraulic lines or other components of the vechicle. Route the RCA cables away from high current wires, if possible run RCA, Power and Speaker cables individually and with a good distance from each other.

POWER CONNECTORS

BATT+ (POWER CONNECTION)

Before mounting the amplifier, disconnect the negative (-) wire from the battery to protect any accidental damage to the amplifier or the audio system. The amplifier is equipped with single 4 AWG power & ground terminals. It is crucial that all terminals are used with the adequate cable to ensure correct operation. Connect the power cables to the power terminal labeled as BATT+.

The amplifier has 3 x 40A internal fuses, however external fuses are required at both the battery and the amplifer. Connect one end of the fuse holder to the power cable and the other end of the fuse holder to the positive battery terminal within 8"/ 20 cm of the same cable. The same shall be done at the other end of the cable that connects to the amplifier. The fuses will protect the system and the vehicle against the possibility of a short circuit in the power cable. Make sure that the fuses and the fuse holder is according to the system requirements.

GND (GROUND CONNECTION)

Locate a secure grounding connection as close as possible to the amplifier.

Make sure the location is clean and provides a direct electrical connection to the chassis of the vehicle. Connect one end of an equal sized cable as the positive cable to the location of ground.

It is important that the ground cable is as short as possible, but no longer than 20" / 50 cm at maximum. Run one end of the cable to the grounding point. Run the other end of the cable to the mounting location. Connect the ground cable to the terminals labeled as GND.

REMOTE (REMOTE CONNECTION)

Run a remote turn on cable from the switched +12V source.

This may be a toggle switch, a relay, the source unit's remote ouput cable or power antenna trigger cable. Connect the remote turn on cable to the power terminal labeled as REM.

INPUT (RCA CABLE)

Run the RCA cables away from the high current cables / speaker cables and connect to the amplifier. Use high qualtity cables with a secure grounding point to avoid amplifier malfunction and / or alternator whine.



REF FOUR



BATT+ (POWER CONNECTION)

Connects to the positive terminal of the battery. For specified performance 4 Ga cable is required. Fuses shall be placed within 8" / 20 cm of the battery.

GND (REMOTE)

Connects to the vehichle's chassis. Keep as short as possible (< 20" / 50 cm). Use minimum 4 Ga cable for optimal conditions.

REMOTE

Connects to switched +12 V from the source unit.

We recommend to use minumum10 Ga speaker cables to acquire the intended performance. Run the speaker cables from your speakers to the amplifier's mounting location. Ensure these are ran separately and away from high current cables and if possible the RCA cables as well. In all cases where cables are penetrating the vechile's chassis use grommets to protect the cable.

Connect the speaker wires according to the terminals on the speaker(s).

Strip 3/8" / 1 cm of insulation of the end of each cable and twist the cable strands together tightly. Make sure there are no stray strands that could touch other cables or terminals as it can cause a short circut. Crimp spade plugs over the end of the cable or tin the ends with solder to provide a solid terminal. Connect the cable ends to the amplifier as shown in the diagram.

INSTALLATION OF THE AMPLIFIER SHALL BE DONE IN THE FOLLOWING STEPS:

1. Connect the +12V wire, keep in mind this wire has to be fused at the battery as well. 2. Ensure the ground is appropriate, then connect it to the amplifier. 3. Connect the switched remote. 4. Reattach negative wire (ground) to the battery. 5. Operation over 15V will cause the amplifier to go into protect & can void the warranty!

REF FOUR -STEREO



SPEAKER IMPEDANCE 1 OHM - 8 OHM Loads under what is specified will cause excessive heat & the amplifier will reach thermal at a faster rate & will eventually go into protect.

Impedance load under 1 ohm stereo is not warranted!

REF FOUR -BRIDGE



SPEAKER IMPEDANCE 2 OHM - 8 OHM

Loads under what is specified will cause excessive heat & the amplifier will reach thermal at a faster rate & will eventually go into protect.

Impedance load under 2 ohm bridge is not warranted!

TROUBLESHOOTING

The protection circuits of the amplifier prevents severe damages from faulty conditions & improper use. The protection indicatior will switch on due to short circuit connection & speaker overload, thus the amplifier will be turned off. Prior to inspecting the occurred problem, turn all levels down & all power off, then carefully check the installation for wiring mistakes, shorts or faulty ground (GND). If the amplifier shuts down due to excessive heat, the protection indicator will light up; please allow time for the unit to be cooled off. Before removing your amplifier, refer to the list below and follow the suggested procedures step by step. If not at ease, contact an authorized installer which can assist you.

AMPLIFIER DOESN'T TURN ON

- Measure voltage on the +12V terminal.
- Ensure that the remote terminal has min. 13.8 V DC remote connection.
- Recheck the ground (GND) connection. Inspect the in-line fuses.
- Check the protection LED is not on.

PROTECTION LED IS LIT ONCE THE AMPLIFIER IS TURNED ON

- Check shorts on speaker wires & the connected load / impedance. Check power cables & GND.
- Disconnect the speaker cables and reset the amplifier.
- High / Low voltage, operation voltage is 11 V ~ 15 V+. Voltages below / beyond this will cause the amplifier to go into protect.

FUSE BLOWING

- Measure the speaker impedance & that it is in accordance with the configuration.
- Inspect the power cable for shorts along with vehicle chassis.

OVERHEATING

- Measure the speaker impedance & that it is in accordance with the configuration.
- Check speaker shorts.
- Ensure airflow around the amplifier is sufficient & that the amplifier is not installed in areas of excessive vibration & upside down!

AUDIO OUTPUT INSUFFICIENT - DISTORTED SOUND

- Ensure that the gain settings on the amplifier is matched with the output level of the head unit.
- Adjust the head unit volume.
- Check speaker shorts.
- Adjust the crossover frequencies in accordance with the setup.
- If no output at all, check the RCA connections & the cable itself.

TURN ON THUMP

- Disconnect the signal input to the amplifier, then turn it on and off.
- a) If the noise is cancelled, then connect a delay turn on module on the REM wire running from the source unit to the amplifier.
- b) Use another 12V source for REM lead to the amplifier. If the noise is cancelled, use a relay to isolate the amplifier from the turn on thump.

HIGH HISS-ENGINE NOISE IN SPEAKERS

- Ensure that all signal transferring wires (RCA, speaker cables etc) are kept seperately / away from the power and the ground wires.
- Bypass all electrical components between the Head unit and the amplifier. Connect the Head unit directly to the amplifier's input. If the noise is eliminated, the unit bypassed is the one causing the noise.
- Remove the existing ground wires for all electrical components installed. Ensure that the point of ground is 100% metal which has been grinded free of rust, paint etc.
- Replace the ground cable from the OEM battery / alternator and ensure it is grounded accordingly.
- Test the battery and alternator load (can be carried out by a professional). Ensure that the vehichle's electrical system is in a good condition, this includes distributor, alternator, spark plugs / wires, voltage regulators etc.





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LIMITED WARRANTY INFORMATION

B2 audio offers a limited warranty under the following terms:

The product is to be free of defects in material & workmanship under normal use for a period of 1 year from the date of the original purchase, when installed by an authorized dealer. Items not installed by authorized dealers will be warrantied for 30 days from the original purchase. Original sales receips must be accompanied with all returns. The warranty applies to the original purchaser of the product & it being sold by authorized B2 audio dealers.

The warranty does not cover: 1. Damage caused by accident, abuse, misuse, improper operation, water / solvents & shipping.

- 2. Product modification, neglect, failure to follow installation instructions & misrepresentation by the seller.
- 3. Products used for competition purposes or are of such a charachter 4. Any product that has been opened.
- 5. Products that has had the serial number defaced, altered or removed.
- 6. The cost of shipping the product back for repair to an authorized repair centre & cost of return of non-defective items.

