B² audio

MODEL: Duo

Product id:DUOMK214F

Duo

OWNER'S MANUAL

dB Drag Racing BASS Race®

dB Drag Racing®

IASCA®

INDUSTRY MEMBER

CE

Introduction

We thank you for purchasing our amplifiers. Your decision to be part of something different is what we strive for. Our products reflects who we are, going to the extent to deliver you our finest comes natural.
Our amplifiers are engineered to accomondate a variety of applications.
Whether it is SPL or SQ, the sound provided will be clean & dynamic.
We refer to it as SQL audiophile products, based on optimizing every aspect of the amplifier to have the highest possible efficiency, while minimizing distortion, causing less stress on the audio reproduction and increasing the Sound Quality & output performance.

For continious news & updates feel free to visit B² at
www.facebook.com/b2audio / www.youtube.com/b2audio / www.b2audio.com / www.twitter.com/b2_audio

To obtain the full potential of the amplifier & 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 whole manual.

dB Drag Racing

dB Drag Racing BASS Race

IASCA INDUSTRY MEMBER

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

	Duo
Circuit Configuration:	2 ch class A/B
Frequency Response:	15 Hz ~ 40 KHz (+/- 1 dB)
Signal to Noise Ratio:	> 100 dB
Input Sensitivity:	0.2 V ~ 6 V
Crossover Circuit:	24 dB / Octave
High Pass Crossover - HPF:	20 Hz ~ 500 Hz (200 Hz ~ 5 KHz)
High Pass Multiplier:	x 1, x 10
Low Pass Crossover - LPF:	50 Hz ~ 500 Hz (500 Hz ~ 5 KHz)
Low Pass Multiplier:	x 1, x 10
Band Pass Crossover - BP:	Yes
Damping Factor:	> 800
Bass Boost:	0 dB ~ 18 dB
Bass Boost Frequency:	35 Hz ~ 120 Hz
Wired Level Control:	Included
Fuse Rating:	300 A
Thermal Protection :	70°C / 158°F
Power Terminal Gauge:	0 Ga x 2
Dimensions:	300 mm x 64 mm x 660 mm / 11.81'' x 2.56'' x 25.98''

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

Specifications

Continious output power (RMS) Measured @ 14.4 V THD < 0.1%

4 Ohm stereo:	500 W x 2
2 Ohm stereo:	900 W x 2
1 Ohm stereo:	1500 W x 2 * (1000 W x 2 @ 12 V)

* @ 0.5% THD, amplifier efficiency will decrease once the amplifier sees a lower impedance load.

Description of Specifications

Stable impedance load of the Duo is 1 Ohm stereo & 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 amplifier will eventually go into thermal protection.
1 Ohm operation will increase the current draw significantly & it is strongly recommended not to run the amplifier at this impedance, unless your battery system is in accordance. The efficiency will never the less drop & THD will increase.

Protection can also be caused by the following
* Speaker overload
* Short circuit
* Input Voltage - RCA & Power Supply.
    - Too high voltage level from the Head Units RCA can at times cause the amplifier to go into go protect when stressed. This can be solved by lowering the input voltage & then retest. Depending on what HU used the voltage will fluctuate. A general tip would be 1.5 V ~ 2.5 V.

Operational voltage: 10 V ~ 15.5 V.
Operational voltage will also be affected by the load of the amplifier.
    - A low impedance load & high or low voltage will stress the amplifier, where it will try to deliver the desired power, being more than designed for, (high voltage & low impedance) or low voltage & low impedance.These factors can narrow the operational voltage.

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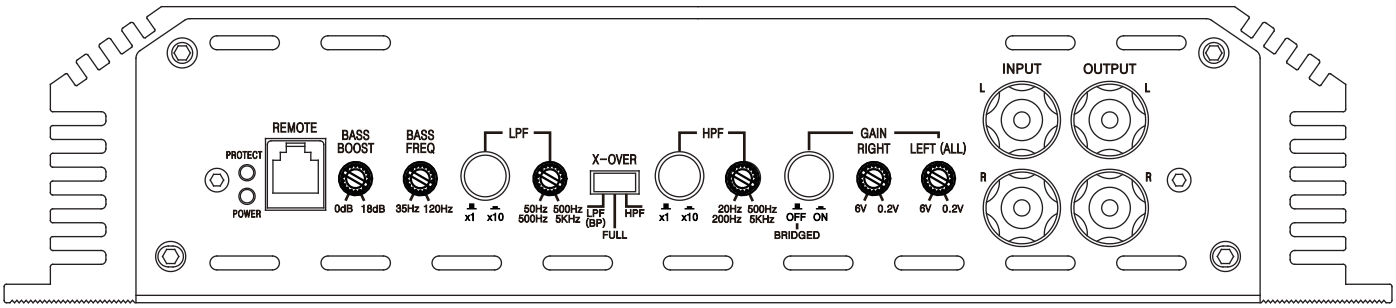
Panel layout

Duo



INPUT
RCA signal input for Left & Right channel.

GAIN RIGHT
Adjusts signal input voltage from the source to match the amplifiers input stage on the Right channel. 0.2 V ~ 6 V is the operational voltage. Voltages beyond may cause damage.

GAIN OFF / ON
Activates common gain, so GAIN LEFT is used for all channels in OFF position. In ON position, individual gain for each channel is active.

X-OVER
Selects crossover mode, Full (Fullrange), HPF (High Pass), LPF (Low Pass), BT (Band Pass) BP will depend on HPF position

LPF (Low Pass Filter)
Variable LPF crossover point within 50 Hz ~ 500 Hz. 1, x10 multiplier switch. Pressed position sets crossover at 500 Hz ~ 5 KHz. There are 41 individual positions, see list on page 7.

REMOTE
Wired level control port.

OUTPUT
RCA signal output for Left & Right channel, used for routing signal to other units.

GAIN LEFT (ALL)
Adjusts signal input voltage from the source to match the amp input stage on the Left channel 0.2 V ~ 6 V is the operational voltage., Voltages beyond may cause damage. Common gain can be activated by selecting ON position on the switch.

HPF (High Pass Filter)
Variable HPF crossover point within 20 Hz ~ 500 Hz. x1, x10 multiplier switch. Pressed position sets crossover at 200 Hz ~ 5 KHz. There are 41 individual positions, see list on page 8.

BASS FREQUENCY
Adjustable bass boost frequency (35 Hz ~ 120 Hz).

BASS BOOST
Adjustable boost level (0 ~ 18 dB).

PROTECT / POWER
Blue light shows normal operation, red light indicates protect setting.

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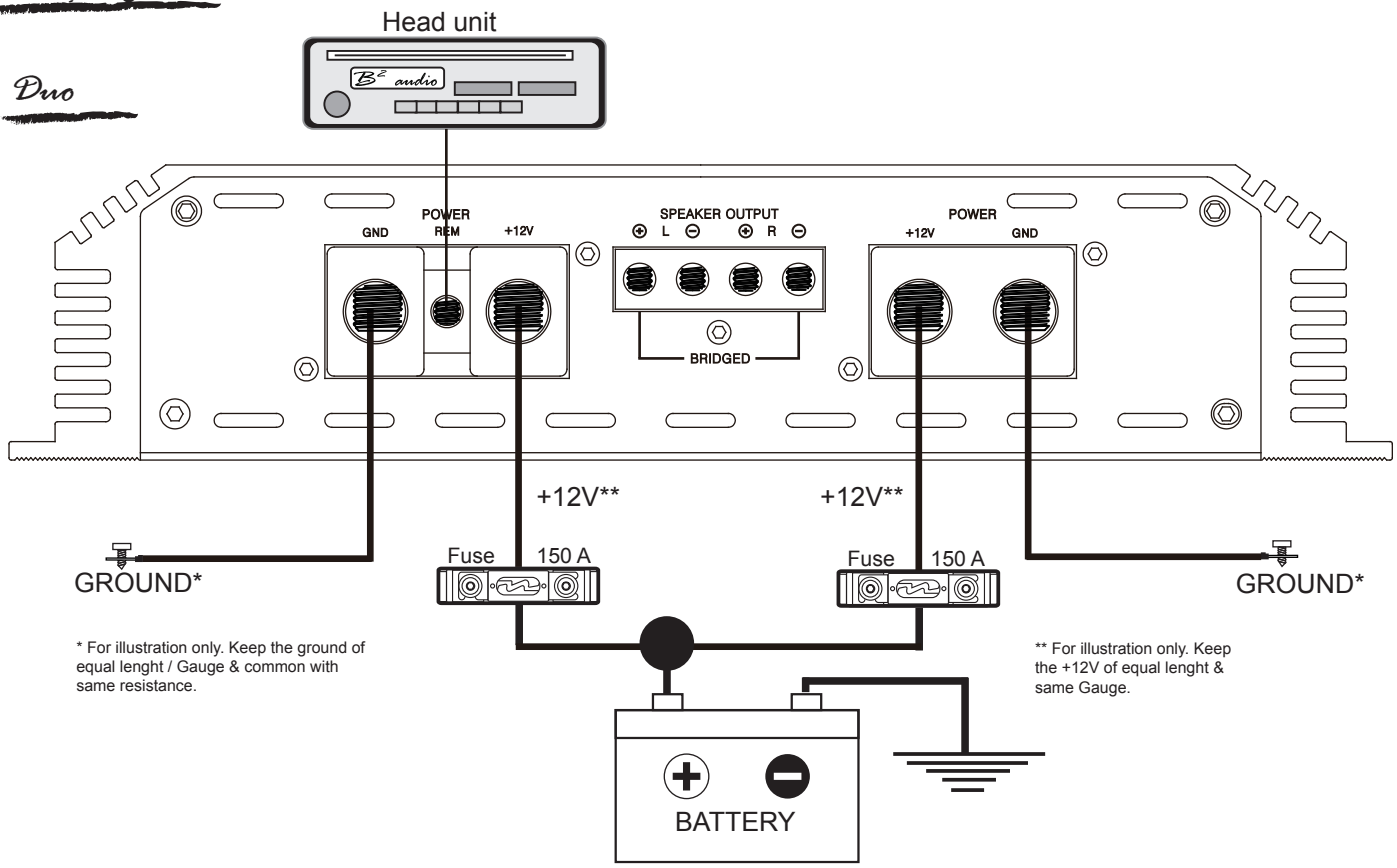
Panel layout

Duo



SPEAKER OUTPUT
Connection to the speakers leads.
Ensure polarity & corresponding channels are correct.
NB! Note the minimum bridged load (2 ohm).
Connections below the stated will cause excessive heat & the amplifier can go into thermal.
Continious thermal mode can cause damage & void the warranty.

+ 12V (POWER CONNECTION)
Connects to the positive terminal of the battery (+12V).
For specified performance 0 Ga cable is required.
Fuses shall be placed within 20 cm / 8” of the battery.
Our amplifiers are designed for low voltage applications.
This sets high requirements to the battery system.
Use multiple batteries with high CCA ratio.

FUSES
The amplifier is not fused, external fusing is required (300 A).
Remember fusing at the battery as well!

REM (REMOTE)
Connect to switched +12V from the headunit.

GND (GROUND CONNECTION)
For connection to the chassis’ ground.
Keep as short as possible (< 50 cm / 20”).
Use minimum 0 Ga cable for specified performance.

⚠ CAUTION

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

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Installation

Installation considerations

If you choose to install the amplifier by yourself, please read the 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 which can damage the amplifier.

Our amplifiers have been designed with a good heat dissipation heatsink.
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 cables, control cables, fuel lines / tanks, hydraulic lines or other components of the vechicle.

Power connectors

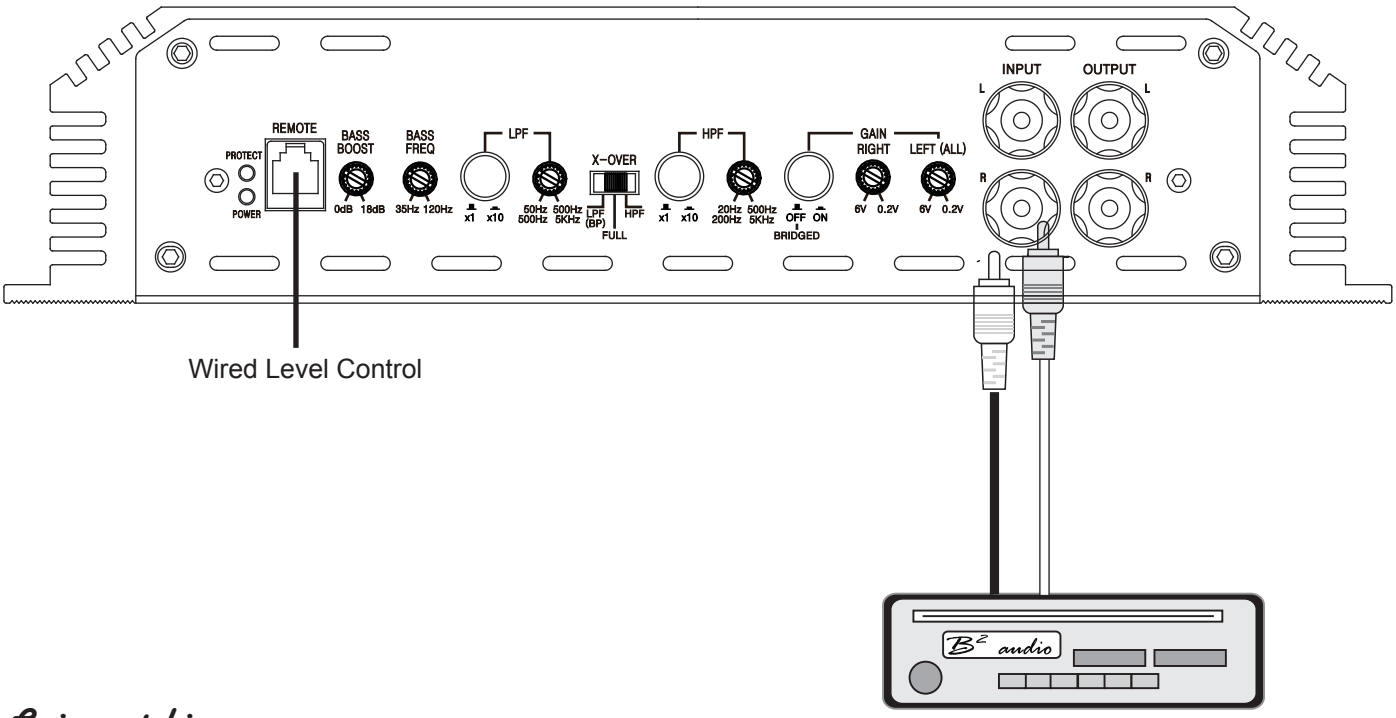
12V (Power connection)
Before mounting the amplifier, disconnect the negative (-) wire from the battery to protect any accidental damage to the amplifier or the audio system. The amplifier is equipped with 2 x 0 AWG power & ground terminals. It is crucial that all terminals are used with the adequate cable to ensure correct operation.
Connect the power cables to the power terminal labeled as +12V.
The Duo is not equipped with fuses, so both the amplifier & the power cables has to be fused at the battery.
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 20 cm / 8'' of the same cable.
This fuse location 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 adequate for the desired application.
Once all cables (pos & neg) are connected to the amplifier, then reattach the negative wire to the battery (final step).

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 50 cm / 20'' 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 terminal labeled as GND.

REM (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.

Wiring layout

Duo



Head Unit, (input voltage 0.2 V ~ 6 V)

Gain matching

In order to match the Head Unit to the amplifier's gain, start with a clean dynamic signal recorded in a high quality format

- Adjust the volume to 3/4 of the HU's max output, this should in most cases give you an undistorted signal. Turn up the gain for the required channel or use the gain bridge function to use a single gain for all channels.
- Once distortion is noticable, then turn back the gain to a level where the signal is clean & your gain is set.

X-over setting Low pass

The crossovers are 24 dB / oct for both HP & LP. They also have a frequency multiplier with a factor of 10. This will expand the frequency range & settings over a wider band is available. To ensure accuracy the pot's feature 41 clicks, each with a corresponding frequency.

Click settings for LPF, x 1, x 10 multiplier

1	53 Hz - 532 Hz	15	117 Hz - 1.18 KHz	29	384 Hz - 3.86 KHz
2	53 Hz - 532 Hz	16	133 Hz - 1.33 KHz	30	411 Hz - 4.15 KHz
3	53 Hz - 532 Hz	17	155 Hz - 1.55 KHz	31	431 Hz - 4.31 KHz
4	54 Hz - 542 Hz	18	182 Hz - 1.86 KHz	32	436 Hz - 4.41 KHz
5	54 Hz - 542 Hz	19	221 Hz - 2.26 KHz	33	446 Hz - 4.50 KHz
6	57 Hz - 572 Hz	20	233 Hz - 2.35 KHz	34	454 Hz - 4.58 KHz
7	60 Hz - 602 Hz	21	244 Hz - 2.47 KHz	35	460 Hz - 4.64 KHz
8	64 Hz - 639 Hz	22	256 Hz - 2.57 KHz	36	472 Hz - 4.72 KHz
9	69 Hz - 687 Hz	23	272 Hz - 2.72 KHz	37	479 Hz - 4.79 KHz
10	73 Hz - 740 Hz	24	283 Hz - 2.88 KHz	38	488 Hz - 4.92 KHz
11	80 Hz - 802 Hz	25	298 Hz - 3.01 KHz	39	502 Hz - 5.11 KHz
12	87 Hz - 873 Hz	26	315 Hz - 3.19 KHz	40	503 Hz - 5.12 KHz
13	95 Hz - 950 Hz	27	335 Hz - 3.40 KHz	41	504 Hz - 5.13 KHz
14	105 Hz - 1.05 KHz	28	359 Hz - 3.60 KHz		

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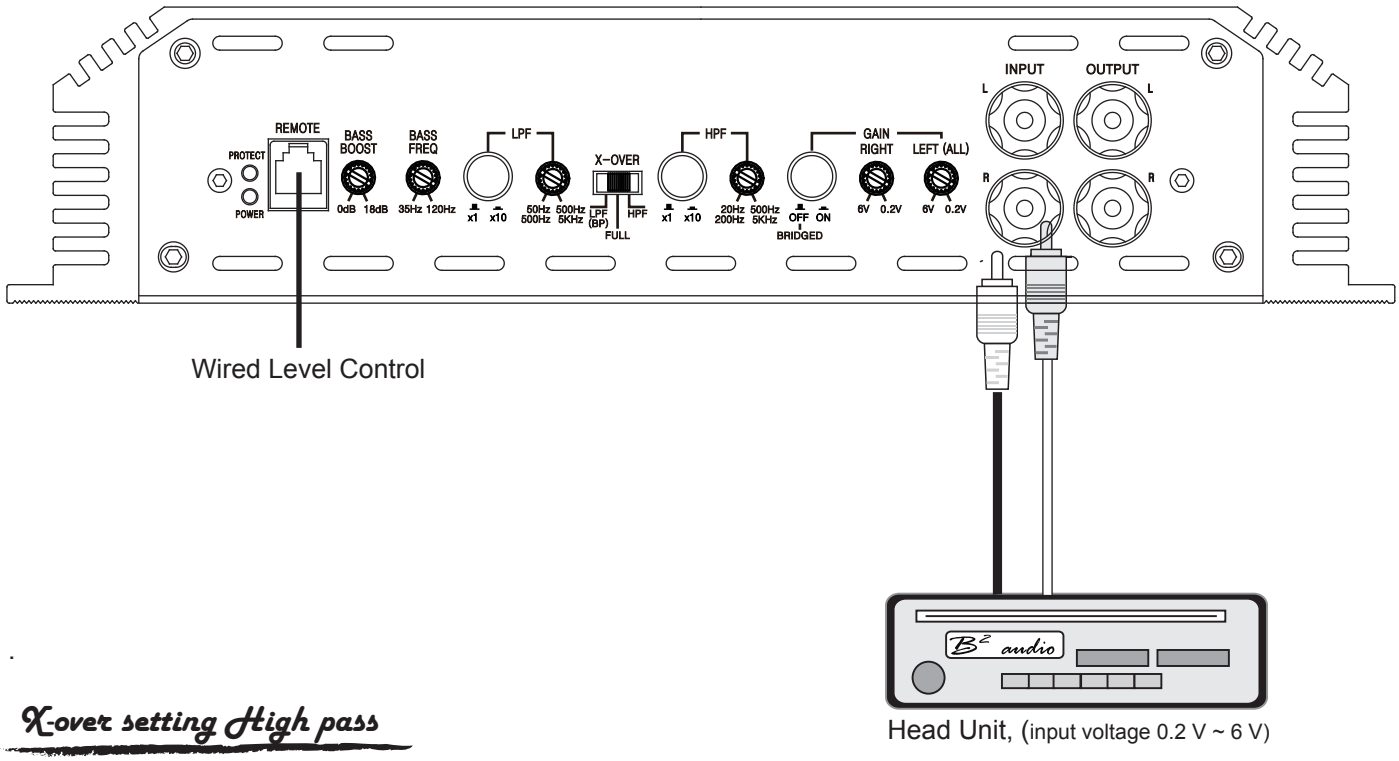
Wiring layout

Duo



Head Unit, (input voltage 0.2 V ~ 6 V)

X-over setting High pass

The crossovers are 24 dB / oct for both HP & LP. They also have a frequency multiplier with a factor of 10. This will expand the frequency range & settings over a wider band is available. To ensure accuracy the pot's feature 41 clicks, each with a corresponding frequency.

Click settings for HPF, x 1, x 10 multiplier

1	23 Hz - 230 Hz	15	63 Hz - 578 Hz	29	308 Hz - 3.11 KHz
2	23 Hz - 230 Hz	16	75 Hz - 693 Hz	30	345 Hz - 3.65 KHz
3	23 Hz - 230 Hz	17	90 Hz - 836 Hz	31	387 Hz - 4.00 KHz
4	26 Hz - 233 Hz	18	114 Hz - 1.08 KHz	32	430 Hz - 4.16 KHz
5	26 Hz - 233 Hz	19	124 Hz - 1.39 KHz	33	439 Hz - 4.31 KHz
6	27 Hz - 247 Hz	20	158 Hz - 1.59 KHz	34	453 Hz - 4.38 KHz
7	29 Hz - 265 Hz	21	172 Hz - 1.69 KHz	35	464 Hz - 4.58 KHz
8	30 Hz - 294 Hz	22	182 Hz - 1.80 KHz	36	475 Hz - 4.68 KHz
9	33 Hz - 332 Hz	23	194 Hz - 1.91 KHz	37	506 Hz - 4.94 KHz
10	36 Hz - 363 Hz	24	207 Hz - 2.06 KHz	38	512 Hz - 5.12 KHz
11	39 Hz - 390 Hz	25	222 Hz - 2.22 KHz	39	523 Hz - 5.15 KHz
12	43 Hz - 441 Hz	26	240 Hz - 2.35 KHz	40	555 Hz - 5.44 KHz
13	48 Hz - 480 Hz	27	255 Hz - 2.59 KHz	41	578 Hz - 5.52 KHz
14	54 Hz - 524 Hz	28	282 Hz - 2.87 KHz		

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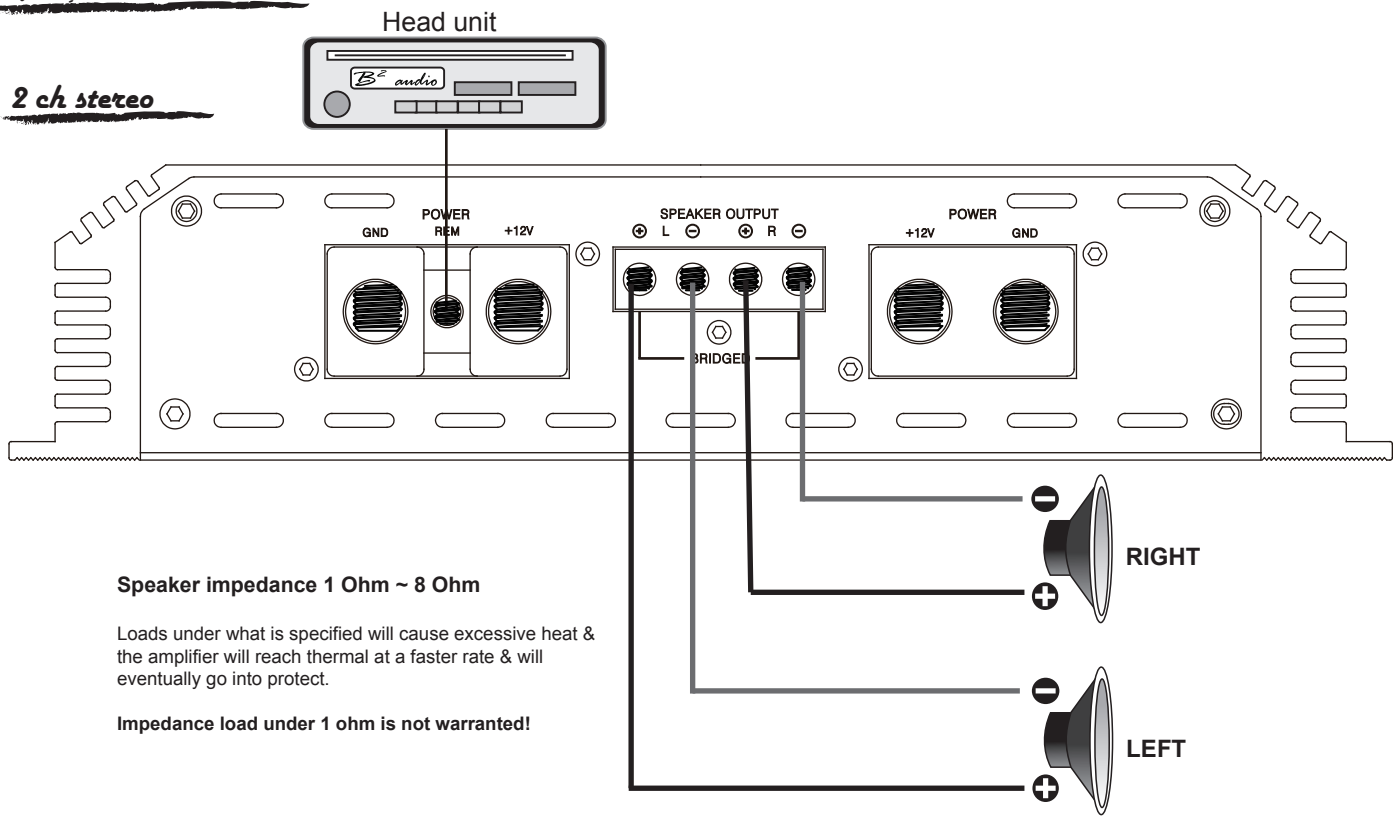
Speaker connection

2 ch stereo

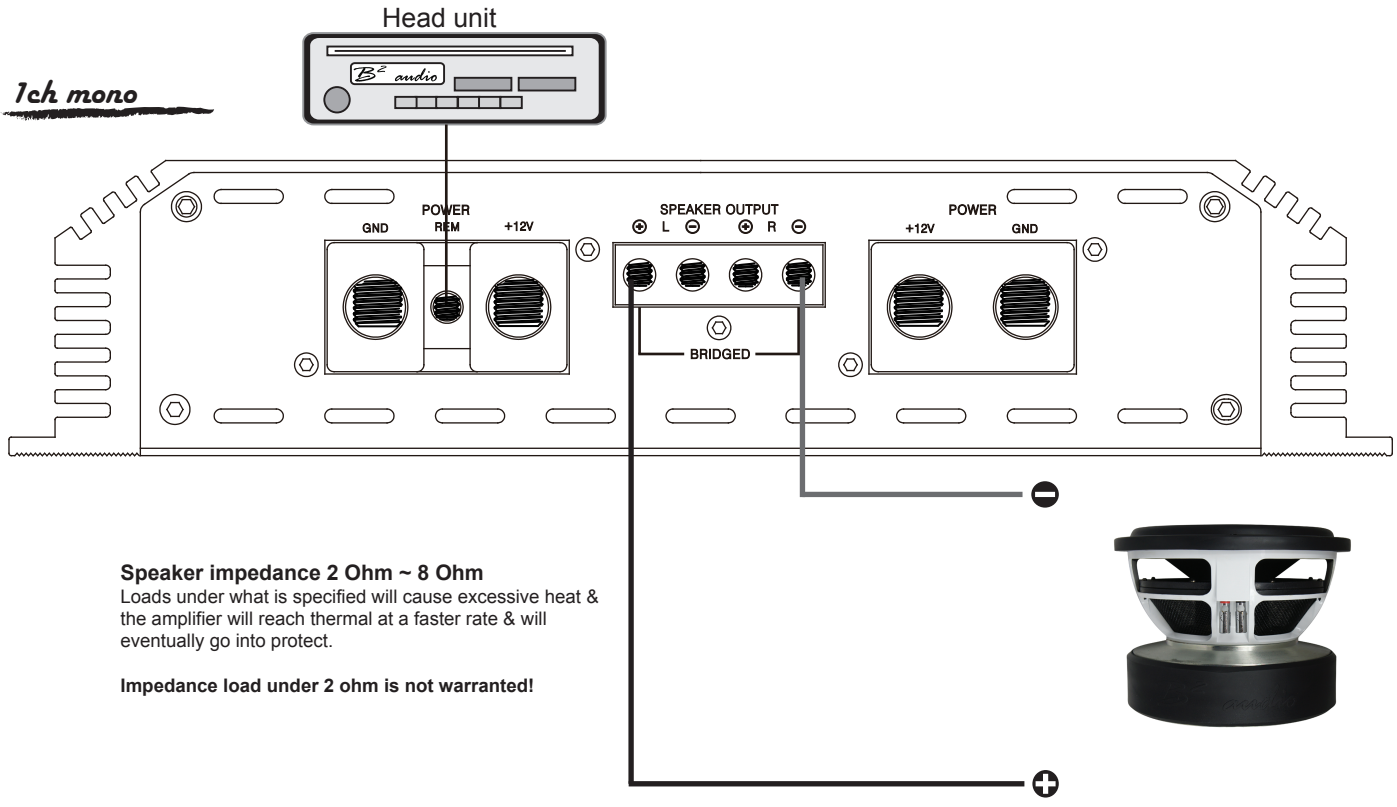


Speaker impedance 1 Ohm ~ 8 Ohm

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 is not warranted!

1ch mono



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 is not warranted!

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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 10 V ~ 15.5 V. Voltages 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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Feel free to visit us at: www.b2audio.com, www.facebook.com/b2audio, www.youtube.com/b2audio, www.twitter.com/b2_audio

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.