



products with a watertight reputation

2 CHANNEL WATERPROOF AMPLIFIER AQ-AD300.2

OWNERS MANUAL



AQ-AD300.2

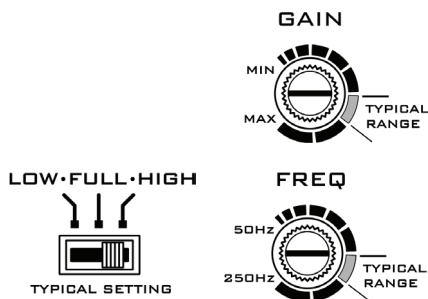
2 CHANNEL WATERPROOF AMPLIFIER WITH
SHOCKWAVE
TECHNOLOGY

PLEASE READ THIS INSTRUCTION MANUAL BEFORE INSTALLATION
AND OPERATION

Please read these notes before you begin installation. We also strongly recommend that you thoroughly read and understand the installation instructions included.

Avoid over-driving your speakers

Follow the instructions given to properly set gain and frequency adjustments. If your system configuration results in settings outside the typical range and something maybe wrong, please contact your local Aquatic AV dealer or Aquatic AV Technical Support.



Check your battery and electrical system

Low battery conditions and poor electrical systems should be diagnosed and corrected before installing your amplifier. Old batteries may be good enough to start your engine but may not be up to the task of powering a high output audio system. Running your amplifier in a low-voltage situation can cause premature distortion, fuse blowout, and system shutdown.

Ensure proper power and ground connections

Never connect or disconnect the control cables with the amplifier(s) powered on.

Always disconnect your battery before working with your electrical system, and keep it disconnected until you are ready to test.

Cover all exposed wires to avoid shorts.

Make your power and ground connections exactly as the instructions specify.

USING YOUR AMPLIFIER

Working safely with your battery

Disconnect the negative battery terminal before doing any electrical work. Always disconnect the negative (–) battery post first, followed by the positive (+), and when it's time to go back together, connect the positive (+) post first, followed by the negative (–). This can minimize the chance of sparks and voltage spikes, and is a good general practice when dealing with any DC electrical system.

Grounding

Bad grounds under are the number one cause of problem installs.

Always use the shortest length of ground wire possible between chassis ground and the amplifier. Never use a ground wire longer than the one we provide.

The ground wire and power wire are equally important; if either one of them is compromised, the amplifier's performance will degrade or cease to function.

Fuses

Always install a master fuse within 12" of the battery for any additional equipment added to your installations electrical system. The mini-fuse installed on the main amplifier only protects the internal circuitry, not the wiring. In the event of a short, failure to install a fuse near the battery can cause damage to your electrical system or the possibility of fire.

Speaker Polarity

The way speaker wires are marked for polarity (+/–) varies from brand to brand. Some manufacturers use the stripe as positive (+), while others use the stripe as negative (–). Be sure to check the documentation of each component you're dealing with before making connections.

Cutting Cables

Always route wires and cables safely, avoiding sharp edges and burrs along the way. Use wire loom when possible. Check for proper length to both termination points, knowing where each component mounts, before you cut anything.

CONTENTS

- AQ-AD300.2 amplifier x1
- Power cable x1
- 24" high level input cable x1
- Low level (RCA to Phono) input cable x1
- Owners Manual x1

SERIAL NUMBER

Please record the model and serial number[s] of your equipment in the space provided below as your permanent record. These numbers can be found on the front and/or bottom of each component. This will assist us with your factory warranty coverage.

Model number[s]:	Serial number[s]:

TERMINOLOGY

Source unit: refers to the device that supplies the amplifier with audio input, typically your radio, head unit, media device, etc.

Main amplifier: AQ-AD300.2, master 2 channel amplifier that functions standalone.

Remote turn-on wire: used to switch the amplifier system on/off, usually controlled by your ignition system, or by the remote lead of a source unit.








Low level input cable: used when rca connectors are the source of input to the amplifier.

High level input cable: used when speaker wires are the only source of input to the amplifier, typically used with a factory source unit.

Manufacturer instructions: refers to any documentation provided by a manufacturer other than Aquatic AV.

QUICK CONNECT SYMBOLS

Keep an eye out for these symbols throughout this manual; they provide a visual link between instructions, diagrams, and the system components.

-  **Power:** Battery positive (+12vdc)
-  **Ground:** Battery negative (–), chassis ground
-  **Remote:** Remote turn-on lead activated by +12vdc
-  **Fuse:** Essential protection from shorts
-  **Line-in:** Source input, low level or high level input
-  **Speaker:** Terminal block connections for speaker output
-  **Configure:** Amplifier configuration features (gain, crossovers, etc.)

SHOCKWAVE TECHNOLOGY™

Aquatic AV's Shockwave Technology brings together outstanding sound quality, high performance characteristics and unprecedented reliability into a single amplifier.

Protected against water and dust with an Ingress Protection rating of IP66 means you can literally hose down our Shockwave Technology amplifiers thanks to a number of unique features exclusive to Aquatic AV (patents pending).

Conformal coated circuit boards protect the smallest components from any humidity or atmospheric moisture, while custom molded grommets around cable extrusions and gaskets between all meeting points eliminate any chance of water or dust intrusion. Aluminium and Stainless Steel are used in chassis construction eliminating any risk of rust or corrosion.

Designed to support the widest variety of applications, Shockwave Technology amplifiers operate both 4ohm and 2ohm speaker configurations, from either low-level (RCA) or high-level (speaker) input connections.

Shockwave Technology incorporates Digital IC's with specially designed low-noise circuitry to produce high-quality, true sound reproduction from any source. The technology used also reduces unwanted EMI (Electromagnetic Interference), which can cause noise in your audio system. Using gold plated RCA's and high quality connectors ensures the best possible listening experience. Digital amplifiers are much more efficient than traditional amplifiers; producing less heat, lowering power consumption, reducing strain on batteries and charging systems.

Shockwave Technology amplifiers combine all these features into a single compact unit and when compared with the competition, still make considerable reductions in both size and weight!

Aquatic AV's Shockwave Technology is now the only sensible amplifier solution for wet, dusty or harsh environments.

WIRING THE AMPLIFIER

1. Route and connect the power wire (without the in-line fuse installed) from the positive (+) battery terminal to the main amplifier terminal labeled PWR.



Do not install the in-line fuse until instructed to do so.

2. Route and connect the ground wire from chassis ground to the amplifier terminal labeled GND.



The majority of problem installs are the result of a poor ground. Refer to section 'Ensure proper power and ground connections' in the Important Information' section for more information.

3. Determine and connect your source unit output to the amplifier input cable(s) using one of the following high or low level input methods:

3.1. High Level input (no RCA connectors available) connect the front speaker output wires from the source unit to the high level input cable (use attached terminals to connect input wires to the speaker wire terminals if possible).



For custom wiring connections, we recommend crimp, solder, and heat shrink.

High Level Input Cables	
2 Channel - use Front only	
4 Channel - use both	
Front Left +	White
Front Left -	White with Black strip
Front Right +	Grey
Front Right -	Grey with Black strip

3.2. Low Level input (RCA connectors available) connect the front RCA output connectors from the source unit to the low level input cable and input jack on the front of the amplifier.




*Very little dielectric grease is needed to keep your connections corrosion free.
Very little moisture is needed to corrode contacts not covered with dielectric grease.*

4. Plug the chosen input cable into the corresponding connector of the main amplifier labeled high or low accordingly.


WIRING THE SPEAKERS

5. Install 4 ohm or 2 ohm speakers of your choice, if they are not already installed.
6. Route and connect the speaker wires from each speaker of your system to the corresponding speaker output terminal block on the amplifier (right/left).

 *Keep the polarities (+/-) of each wire pair correct between the amplifier(s) and speakers.*

TESTING & TUNING THE SYSTEM

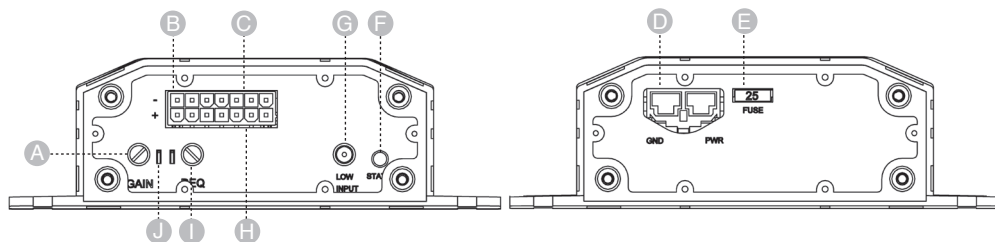
7. Re-connect the positive (+) side of the battery, followed by the negative (-) side.

 *Do not install the in-line fuse until after this step. This is a good time to re-check your connections before installing the fuse. Make sure that all control cables are completely seated and latched in their respective connectors, and that power and ground are properly connected to the main amplifier.*

8. Install the 25 amp ATC fuse into the in-line fuse holder on the power wire.
9. Perform a basic system test, verifying that the amplifier(s) power up (led on each component should light) and that the speakers function properly. If not, proceed directly to **Troubleshooting** in the User Guide section.
10. Configure, test, and tune your system by following the **Test and Tune** instructions given in the User Guide section of this manual. When you've completed these instructions the installation is complete.

CONNECTORS & CONTROLS

The images below list the controls and connectors of the AQ-AD300.2 amplifier.



A	INPUT GAIN ADJUST	E	AMPLIFIER PROTECTION FUSE	I	CROSSOVER FILTER ADJUST
B	HIGH LEVEL INPUTS	F	POWER & STATUS LED	J	CROSSOVER MODE SWITCH
C	SPEAKER OUTPUTS	G	LOW LEVEL INPUT		
D	POWER & GROUND TERMINALS	H	REMOTE TURN-ON TERMINALS		

CONNECTORS DEFINED

High level input connector

This connector allows the amplifier to use speaker outputs from a source unit as inputs to the amplifier.

Wire colors for the high level input cable(s):

High Level Input Cables	
Left +	White
Left -	White with Black strip
Right +	Grey
Right -	Grey with Black strip

Low level input connector

This connector allows the amplifier to use industry standard RCA outputs from a standard source unit as inputs to the amplifier. This is the preferred method when RCA outputs are available, and will produce the cleanest source signal to the amplifier.

i We use industry standard 3.5mm headphone style jacks on the amplifier due to the space constraints (2x 3.5mm phono-jacks are a lot smaller than 4x RCA jacks). Although we highly recommend using the low level input cables we supply with the kit, technically you should be able to utilize any standard RCA to Phono adapter cable found at your local electronic store to make these connections.

CONNECTORS DEFINED (CONT.)

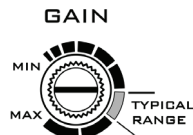
Input gain adjustment

A common misconception about gain adjustment on amplifiers is that “more gain = more volume”. Actually, it’s not the volume that’s being increased, but rather the amplifier’s sensitivity to the source input. By increasing the gain level, you’re increasing how sensitive the amplifier is to the signal it receives from the source unit. This is why it’s important to set the gain properly, rather than simply turning the knob until it’s really loud.

Gain allows the following nominal operating level adjustments:

Low level input (RCA line-in) - 250mv to 2.5V

High level input (speaker-in) - 500mv to 5V



These voltage levels can accommodate virtually any source unit, as well as just about anything that has RCA or line-out style outputs.



Setting the gain too high in an attempt to get “more volume” can not only cause premature distortion, but can also damage your speakers. If your system configuration results in your gain control being set outside the typical range as indicated above, call Aquatic AV to resolve the problem.

Crossover mode switch

This switch selects which range of frequencies that the built-in crossover will filter. Each mode is equipped with 12dB per octave electronic filters for precise frequency attenuation with minimal phase distortion. The options are as follows:

LOW • FULL • HIGH



Low – low-pass – used when speaker outputs will drive subwoofers, or low range speakers only.

LOW • FULL • HIGH



High – high-pass (default) – used when speaker outputs will drive middle to high range speakers only (recommended setting for full range speakers).

LOW • FULL • HIGH



Full – full-range – used when speaker outputs will drive full range speakers only. This by-passes and disables the crossover circuit. Note: changing the crossover filter control will produce no effect in this mode.

CONNECTORS DEFINED (CONT.)

Crossover filter adjustment

The purpose of a crossover circuit is to filter out a specific range of frequencies from a speaker's input to maximize its performance. For a tweeter, the goal is to filter out low (bass) range frequencies to maximize the high range (treble) response. Conversely, for a subwoofer, the goal is to filter out the high and mid range frequencies, leaving only low frequencies to play through the woofer. There are two kinds of crossover implementations, active or passive:

Active Crossover

This filters selected frequencies before the audio signal is amplified, between the source unit and amplifier. Our built-in crossovers are an example of this type of crossover.

Pros:

By removing unwanted frequencies from the signal before it's amplified, your output becomes more efficient, only working to amplify the desired range of frequencies.

Cons:

By removing unwanted frequencies from the signal before it's amplified, you are dedicating those filtered channels to only provide a certain frequency range.

Passive Crossover

This filters selected frequencies after the audio signal has been amplified, between the amplifier and speaker. Some speakers are sold with passive crossovers included, typically a small plastic enclosure, or capacitors and/or coils mounted directly to the speaker.

Pros:

By removing unwanted frequencies from the signal after it's amplified, your amplifier's output is still full range, allowing more flexible use, able to drive tweeters, mid-range, and subwoofers alike.

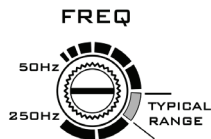
Cons:

By removing unwanted frequencies from the signal after it's amplified, you are forcing the full range of frequencies to be amplified, reducing the amplifier's maximum possible efficiency.



Our built-in active crossover(s) are fully adjustable from 50hz to 250hz, using either a low-pass mode (bass only) or high-pass mode (midrange and highs only) to easily maximize your speaker's potential.

Default: when using any 6.5" to 8" speakers, the recommended settings are high pass mode with the frequency filter set at or above 150hz.

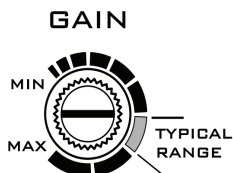


TEST & TUNE

Setting the gain

With the system functioning properly, follow these steps to set the gain control:

1. Turn the gain control(s) all the way down (counter-clockwise).
2. Turn the key to the accessory position, and then turn the source unit on.
3. Set all tone (bass, treble) and equalization controls (balance, fade) on the source unit to “flat” or “0”, and turn off “loud” or “loudness”. If a separate equalizer is used, disable or set all of it’s controls to “flat” or “0”.
4. While playing a standard non-MP3 CD¹, set the source unit’s volume control to 75% of maximum level.
5. Slowly increase to gain control until you hear a slight distortion of the audio playback. This should result in the typical range.

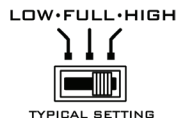


Setting the gain too high in an attempt to get “more volume” can not only cause premature distortion, but can also damage your speakers. If your system configuration results in your gain control being set outside the typical range as indicated above, call Aquatic AV to resolve the problem.

Setting the crossover

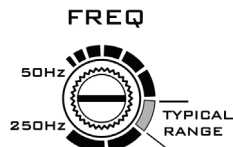
With the system functioning properly, follow these steps to set the crossovers:

1. Select the desired mode for each crossover mode switch; low for low-pass mode or high for high-pass mode (default).



Note: if the desired mode is full for full-range, changing the crossover filter control will produce no effect in this mode.

2. Set all tone (bass, treble) and equalization controls (balance, fade) on the source unit to “flat” or “0”, and turn off “loud” or “loudness”. If a separate equalizer is used, disable or set all of it’s controls to “flat” or “0”.



3. While playing a standard non-MP3 CD¹, set the crossover filter adjuster to the desired frequency (150hz or above default).

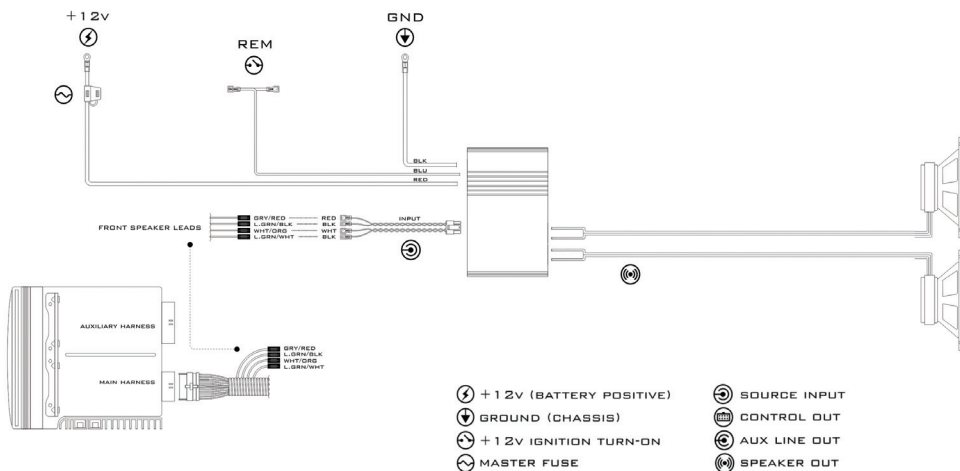
Note1: this is the preferred audio testing source method, as MP3, XM, FM, and am all have some level of compression or degradation involved, which can lead to varying results. If the preferred method is not available, use the most common playback method you will use.

TROUBLESHOOTING MATRIX

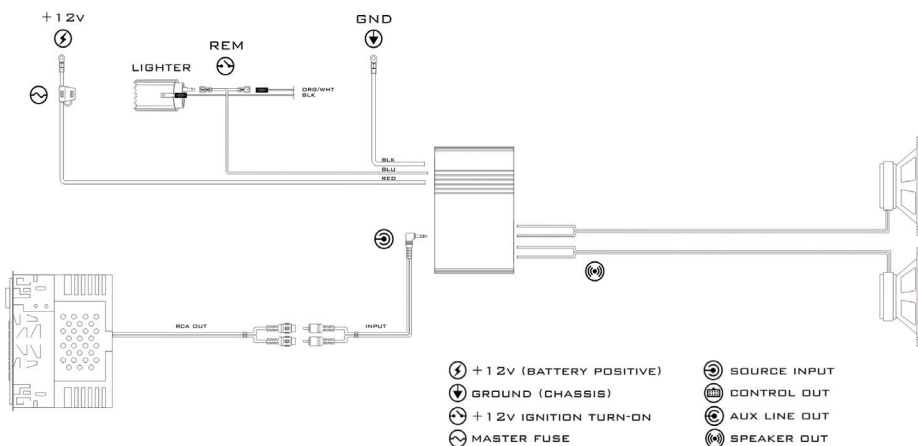
Problem	Probable Cause	Solution
Amplifier doesn't power up (LED is off)	REM wire is not providing +12V to the amplifier	Check wiring for remote turn-on wire. Make sure the turn-on source is providing 12V.
	PWR wire is not providing +12V to the amplifier	Check this wire all the way to the battery. Make sure in-line fuse is installed and has not blown.
	GND wire is not providing ground to amplifier	Make sure the ground location selected is providing a good, clean ground.
Amplifier powers up, but makes no sound (LED is on)	Speaker wires are not connected, or shorted	Check wiring from the amplifier to each speaker in the system. Make sure the wire terminals are not shorting.
	Input from source unit not connected properly	Check High or Low level input wiring from the source unit to the main amplifier.
	Source unit has no output	Check source unit is functioning properly. Refer to manufacturers instructions if necessary.
Speaker output sounds low or distorted	Input gain level set incorrectly	Set the gain levels using instructions in the 'Test and Tune' section of this manual. If already completed this step, lower the gain slightly until the distortion stops.
	Low battery condition	Check your battery for proper charge and replace if necessary.

SYSTEM DIAGRAMS

SYSTEM ONE



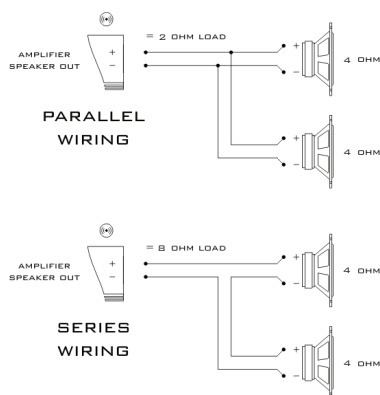
SYSTEM TWO



CUSTOM WIRING SOLUTIONS

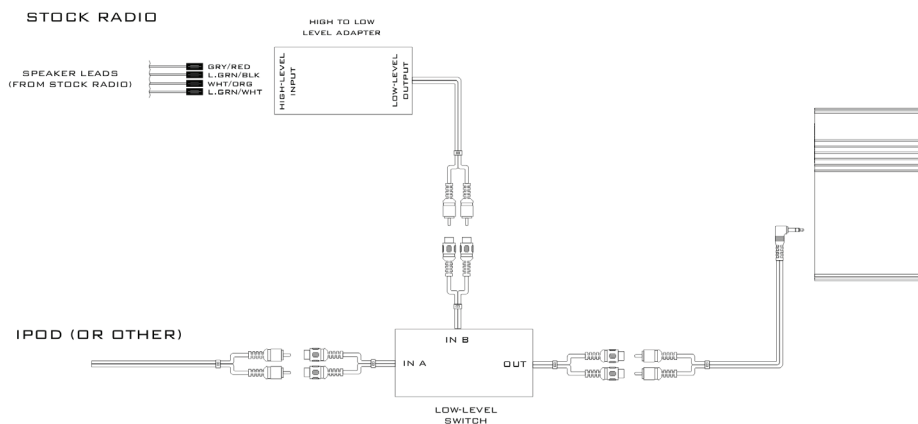
Powering two speakers with a single amplifier channel.

In some cases, there might be a need to drive two speakers with a single amplifier channel. This configuration is possible providing that a 2 ohm load is maintained at the amplifier output. To the right are examples of both parallel and series wiring applications for proper impedance matching. Note the way that while parallel wiring divides each speakers impedance, series wiring adds each speaker impedance together.



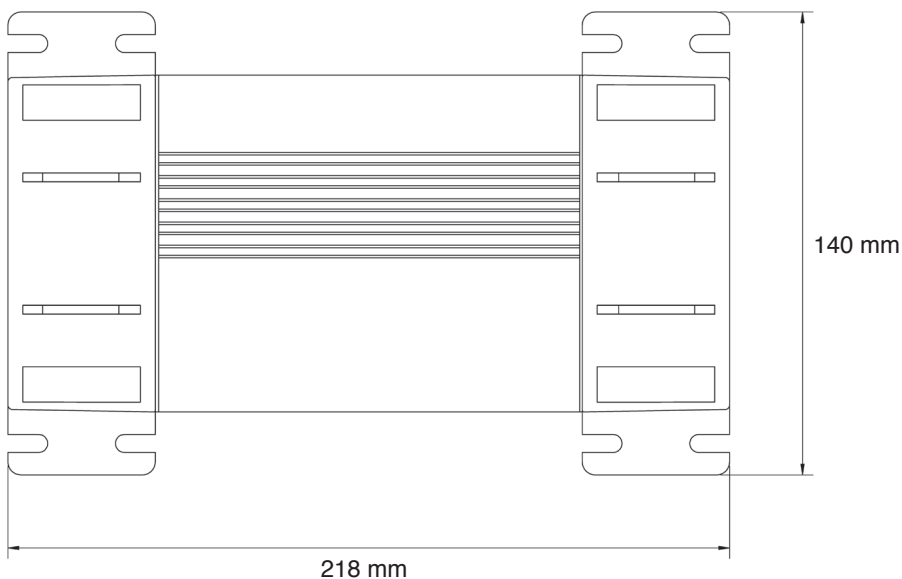
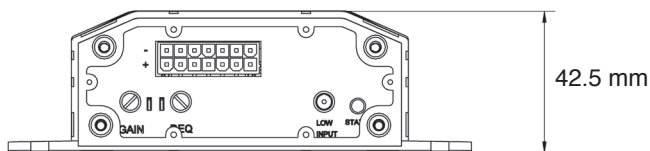
CUSTOM WIRING SOLUTIONS

In order to utilize a low-level aftermarket input switch, it's necessary to convert the stock high-level outputs to low-level before the input switch itself. The diagram below shows an example of this kind of switched input.



Input channels:2x high level, 2x low level
 Output channels: 2 channels
 Nominal output impedance: 4 ohms
 Nominal power output @ 4 Ohms (RMS): 150W (2 x 75W)
 Nominal power output @ 2 Ohms(RMS): 288W (2 x 144W)
 Frequency response: 10hz-50khz
 Low level (rca line-in) sensitivity: 200mv – 6v
 High level (speaker-in) sensitivity: 400mv – 12v
 Input impedance: 33k ohms

Dimensions (HxWxD):..... 42.5 x 218 x 140 mm
 Typical sound reproduction quality @ 4 Ohms: 0.005% thd+n @ 70w
 0.010% thd+n @ 75w
 10.0% thd+n @ 117w



Aquatic AV offers a limited warranty of our products on the following terms:

Length of warranty

2 years on audio systems, electronics, speakers, and accessories (receipt required).

Coverage

This warranty covers only the original purchaser of a Aquatic AV product purchased from an authorized Aquatic AV dealer in the United States. In order to receive service, the purchaser must provide Aquatic AV with a copy of the receipt stating the customer name, dealer name, product purchased and date of purchase.

Defective products

Products found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Aquatic AV's discretion.

What is not covered

Damage caused by accident, abuse, improper operations, water, theft.

Any cost or expense related to the removal or reinstallation of product.

Service performed by anyone other than an authorized Aquatic AV service center.

Any product with the serial number or tamper labels defaced, altered, or removed.

Subsequent damage to other components.

Any product not purchased from an authorized Aquatic AV dealer.

Limit on implied warranties

Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for hawg wired any other liability in connection with the sale of the product.

How to obtain service

You must obtain a return material authorization number (RMA) to return any product to Aquatic AV.

You are responsible for shipping charges of returned products to Aquatic AV.

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