

MS - AM402

MARINE AMPLIFIER

Manual



FUSION[®]

Contents

Feature Overview	Pg 3
Control Descriptions	Pg 4
Installation	Pg 6
Connections	Pg 6
Inputs and Gain Setup	Pg 8
Single Channel Installation	Pg 8
Two Channel Installation / Power Cable Calculator.....	Pg 9
Trouble Shooting / Specifications	Pg 10

Feature Overview

- 2 Ohm Stable MOSFET Amplifier Design
- Variable Bass Boost 0 - + 18dB
- Variable LP and HP Electronics X-OVER @ 18dB/octave
- 4 Gauge Power and Ground Connections
- Nickel Plated Audio Input and Output RCA Connections
- Nickel Plated RCA Output for multi-amp Installations

2-OHM STABLE STEREO

Provides the option of connecting an extra pair of speakers in parallel, 2 per channel at 2-Ohms (A total of 4 speakers).

MARINE GRADE CONNECTIONS

Nickel plated RCA connectors and stainless components improve signal flow for optimum output

CLASS-AB DESIGN

The 400 Watt peak 2-Ohm stable (per channel) design ensures clean and powerful amplification of the input signal, enough to rock the boat.

CONFORMAL COATED CIRCUITRY

Provides added protection from salt air and moisture to ensure maximum product life.

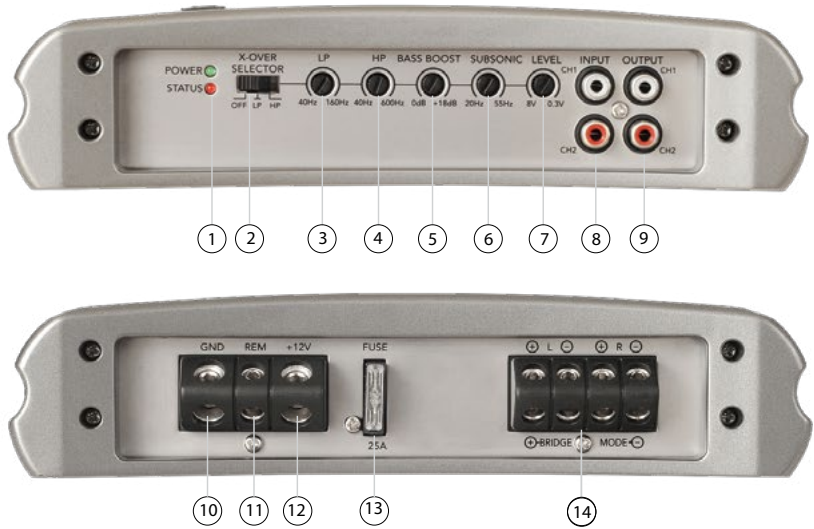
MARINE GRADE CHASSIS

Stainless steel end and bottom plates provide a stunning finish coupled with environmental protection.

RCA LINE OUT

A pass through RCA output enables linking of multiple amplifiers for enhanced system performance

Control Descriptions



1 Power And Status LEDs:

This shows if the amplifier has been correctly powered up and if any faults are present.

2 Crossover Selector:

Set the appropriate mode of operation. The 3 positions available are OFF, LP and HP.

3 Low Pass:

Set the crossover switch 2 to LP when a subwoofer is connected. Ensure the crossover frequency is set at 100Hz or below, this feature is designed to filter all mid to high frequencies that only FULL RANGE speakers should produce. NOTE: Failure to do so could result in speaker damage.

4 High Pass:

Set the crossover switch 2 to HP and turn this control to 65Hz or above when using speakers smaller than 6", this feature is designed to filter all low bass frequencies that only SUBWOOFERS should produce. NOTE: Failure to do so could result in speaker damage.

5 Bass Boost:

This is a variable control to increase the bass boost at 45Hz from 0 to +18dB of gain, adjust to suit.

6 Subsonic Filter:

This is a variable control filters out all Sub Bass Frequencies below the set point at 18dB/octave.

7 Level:

This allows level adjustment of the input signal. Use this control to correctly match the head unit to the amplifier. To set this control correctly, turn the amplifier level to MIN and the head unit to 3/4 volume, with the BASS and TREBLE on zero , then slowly turn up this amplifier level control towards the MAX end of the control.

NOTE: If the sound becomes distorted, turn this control down.

8 RCA Input:

Connect these RCA connectors to the LOW LEVEL output connection from the head unit.

9 RCA Output:

Use these RCA Output connectors to connect to a secondary amplifier. This output is a PASS-THRU connection derived from the RCA input connector so the signal level and frequency response are the same as the original input signal.

10 Ground Connection:

Connect directly to a suitable ground point via a 4 gauge power cable. NOTE: This is to be the first wire to connect. Damage could result if this is not done.

11 Remote Connection:

This input is for turning the amplifier on and off. This requires a switched positive (+12V) to power 'ON' the amplifier, this can be found on the rear of the head unit in the form of an electric antenna output, or a remote on output. If not available you can wire to a switched +12V supply.

12 Power +12V Connection:

This must be connected to the battery positive (+) terminal via a 4 gauge power cable and with an inline fuse or circuit breaker at the battery end. NOTE: This is to be the last wire to connect up during installation as damage could result.

13 Fuse:

Please ensure the correct type of fuse is fitted, as specified in this manual. PLEASE NOTE: the MS-AM402 has 1x 25A fuse.

14 Speaker Output:

See channel installation diagrams in this manual for correct speaker connection.

Installation

Mounting

Appropriate mounting is very important for the prolonged life expectancy of any amplifier. Select a location that allows enough space so sufficient airflow is maintainable and a location that provides protection from moisture. Keep in mind that an amplifier should never be mounted upside down. Upside down mounting will compromise heat dissipation through the heatsink and could engage the thermal protection circuit. Excessive heat will shorten your amplifiers life. To maximise heat dissipation, be sure to leave at least 2.5" of clearance around the amplifier. If space is of the essence and the amplifier must be mounted in an enclosed or restricted area, a small 3 inch fan should be used in correspondence with a duct so the heat can flow past the Heatsink.

To avoid scratching your new FUSION amplifier, pre-drill the mounting holes with either a 3mm or 9/64" diameter drill bit and use the screws supplied in the accessory kit. Be sure to investigate your mounting area thoroughly to avoid electrical wires, vacuum lines or fuel lines.

Installation Options

The quality of installation will affect the performance and reliability of your FUSION amplifier. For maximum performance we recommend you have your new FUSION amplifier installed by an authorised FUSION dealer. Our highly skilled dealers have vast knowledge of our products and their installation techniques are necessary to unleash the high performance capabilities of your amplifier.

If you decide to connect the amplifier yourself, it is important that you read this manual carefully and throughout before starting. Once you have finished reading and you still have questions regarding installation, we recommend your FUSION dealer.

Connection

FUSION amplifiers are designed to work within a 10 to 16 volt DC range. Before any wires are connected, the vessel's electrical system should be checked for correct voltage supply with the help of a voltmeter. First, check the voltage at the battery the voltmeter should read between 12 and 13.8 Volts. If your vessel's electrical system is not up to these specification, we recommend having it checked by an auto electrician before any further installation. Once the vessel is checked, make certain the correct cable size is used. We recommend using the following cables calculator diagram on page 9 to calculate the correct power cable for your application.

Power

FUSION amplifiers should be wired directly to the battery using the appropriate sized cable. Start at the vessels battery and run the power cable through to the amplifier. FUSION recommends the use of grommets when passing the power cable through any metal wall to avoid sharp corners or sharp body parts that may easily cut through the insulation on the cable.

Avoid running the power cable over engine components. The use of an inline fuse or circuit breaker is a must, this will prevent the risk of a potential fire caused be a short in your power cable. Connect the fuse holder or circuit breaker as close to the

battery positive terminal as possible. Use a fuse or circuit breaker of equal value as that found on the chassis of your FUSION amplifier. You may now connect the cable to the battery, but remember to leave the fuse out or circuit breaker off until all other cable connections are made.

Ground

When grounding your FUSION amplifier, use the same gauge cable for ground as you did for the power. Secure the ground cable to the appropriate ground point, now its time to connect the power and ground cables to the amplifier. Cut both cables to length. Use a hex type screwdriver to loosen the +12V and the GND connections on the amplifier. Terminate the ground first, and then the +12V and please make sure that you terminate them into the correct terminals. Then tighten the screws down securely.

Speaker Load

Keep in mind FUSION 'AM' series amplifiers are high power amplifiers and not high current amplifiers. In other words they require a minimum impedance of 2 ohms STEREO and 4 ohms bridged MONO to operate trouble free. Too low of an impedance could send your FUSION amplifier into protection mode and/or damage the amplifier.

Remote Turn-on

This terminal must be connected to a switched +12V source. Typically, remote turn-on leads are provided at the head unit which will turn on and off the amplifier. If the head unit does not have a remote turn-on lead, then a power antenna wire can be used. If neither of these leads are present on the head unit then a switched +12V supply must be used, like the ACC +12V.

Run a minimum of 18 gauge wire from the amplifier location to the source of the switched +12V lead. Connect the source remote output to the wire. Go back to the amplifier and cut the wire to length. Loosen the screw terminal marked REM on the amplifier using a hex type screwdriver. Slip the wire into the connector and tighten the screw securely.

Inputs & Gain Setup

Low Level Inputs

Be extra careful with your RCA interconnects. Hiss, engine noise, and fan noise can easily be picked up through RCA cables if run incorrectly. Avoid running your RCAs near large wire looms and electric fans if possible. Run your RCA cables on the opposite side of the power cable. Be sure to check for correct balance (Red is right and black or white is left)

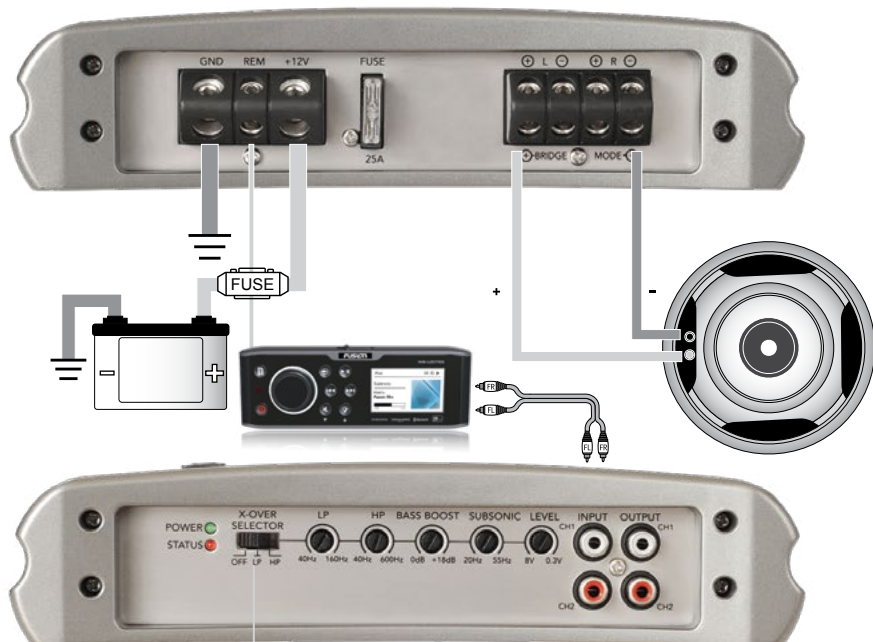
Level Control

On the amplifier, is the LEVEL control, this control allows you to match the input level of the amplifier to the output level of your head unit. Matching the input can be accomplished in three simple steps:

1. Turn the LEVEL control on the amplifier to minimum.
2. Turn up the head unit and adjust to 2/3 maximum volume ensuring that the BASS and TREBLE are set to zero.
3. Adjust the LEVEL control until the desired volume is achieved without audible distortion.

Remember, the gain control is not a volume control. Ignoring the three steps above may leave you with damaged speakers and/or a damaged amplifier.

Single Channel Installation

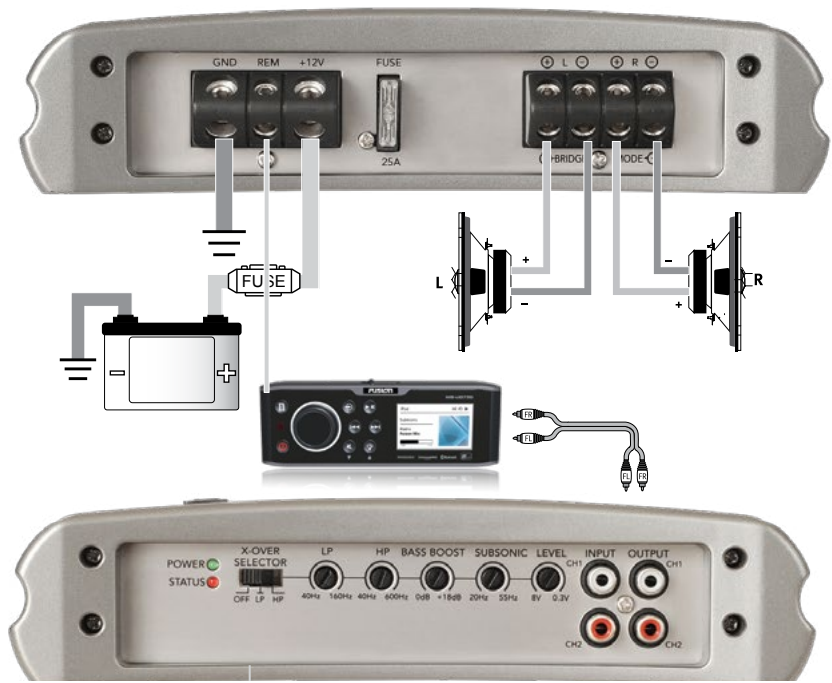


Power Cable Calculator

Total Amperage	0-4ft	4-7ft	7-10ft	10-13ft	13-16ft	16-19ft	19-22ft	22-28ft
0-20	14	12	12	10	10	8	8	8
20-35	12	10	8	8	6	6	6	4
35-50	10	8	8	6	4	4	4	4
50-65	8	8	6	4	4	4	4	2
65-85	6	6	4	4	2	2	2	0
85-105	6	6	4	2	2	2	2	0
105-125	4	4	4	2	0	0	0	0
125-150	2	2	2	0	0	0	0	0

The above chart shows cable gauges to be used, if no less than a 0.5 volt drop is acceptable. If aluminium wire or tinned wire is used, the gauges should be of an even larger size to compensate. Cable gauge size calculation takes into account terminal connection resistance. 1 Metre = 3.28 Feet

Two Channel Installation



Trouble Shooting

Problem	Cause	Solution
Power LED not 'ON'	Fuse at battery blown or not installed	Replace with correct type and rated fuse.
	Improper connections	Check that the ground wire, power wire and the remote wires are connected to the correct terminal
Status LED 'ON'	Fuse blown	Replace with correct type and rated fuse.
	Amplifier too hot	Move the amplifier into a more ventilated area
	Speaker wires shorted	Check that there are no speaker wires shorted to any other wire and also check if any wire is shorted to ground
	Internal malfunction	Disconnect all wires except ground, power and remote. Then turn the amplifier 'ON', if the protection light is still 'ON' then return for service

Specifications

Signal to Noise Separation	>95dB
Input Sensitivity	>60dB
LP Variable Crossover	300mV - 8V
HP Variable Crossover	40Hz - 160Hz @ 18dB/octave
Variable Bass Boost	40Hz - 600Hz @ 12dB/octave
Variable Subsonic Filter	0 - + 18dB @ 45Hz
Input Impedance	20Hz - 55Hz @ 18dB/octave
Damping factor	20k Ω
T.H.D	>200
Fuse Ratings	0.05%
Dimensions(mm)	1 x 25A
	229 (W) x 296(L) x 53vz(H)

12.6 Volt power output specification

- 50 Watts RMS x 2 @ 4 Ω 1% THD+N
- 96 Watts RMS x 2 @ 2 Ω 1% THD+N
- 160 Watts RMS x 1 @ 4 Ω Bridged 1% THD+N

14.4 Volt power output specification

- 65 Watts RMS x 2 @ 4 Ω 1% THD+N
- 100 Watts RMS x 2 @ 2 Ω 1% THD+N
- 200 Watts RMS x 1 @ 4 Ω Bridged 1% THD+N