

# FUSION®

USER / INSTALLATION MANUAL

**MS-FR4021, MS-FR6021, MS-FR7021**

2-WAY FULL RANGE  
MARINE SPEAKERS



## **FUSION'S STAMP OF QUALITY AND ASSURANCE**

TRUE MARINE PRODUCTS ARE DESIGNED AND ENGINEERED AT FUSION'S INDUSTRIAL DESIGN HEADQUARTERS IN AUCKLAND, NEW ZEALAND SPECIFICALLY FOR THE MARINE ENVIRONMENT.



'True Marine' products are subjected to rigorous environmental testing under harsh marine conditions to surpass industry guidelines for marine electronics.

Any product that bears the 'True Marine' stamp of assurance has been designed for simplicity of use and combines the most advanced marine technologies to deliver an industry leading entertainment experience. All 'True Marine' products are supported by FUSION's 3 Year Worldwide Limited Consumer Warranty. You can be assured FUSION stands by its products and takes pride in delivering 'True Marine' quality products for your vessel.

This FUSION Full Range Marine Speakers are carefully designed and manufactured specifically for marine use. All FUSION Full Range Marine Speakers feature a unique high tech bass/mid cone, a fluid cooled titanium dome tweeter, engineered to minimise magnetic interference, and are constructed to comply with IP65 water resistance standards.

These speakers have been thoroughly tested to ensure consistent and reliable performance is achieved in the challenging marine environment. If you have any questions about the installation and/or operation of this product, contact your nearest Authorised FUSION Dealer for further assistance.

## LIST OF CONTENTS

- 1 x Pair Speakers
- 1 x Pair Standard Ice White Grilles
- 1 x Pair Midnight Black Grilles (MS-FR6021, MS-FR7021 only)
- 2 x Fully Tinned Speaker Wires
- 8 x Stainless Steel Mounting Screws
- 2 x Mounting Gaskets
- Manual
- Warranty Card
- Mounting Template

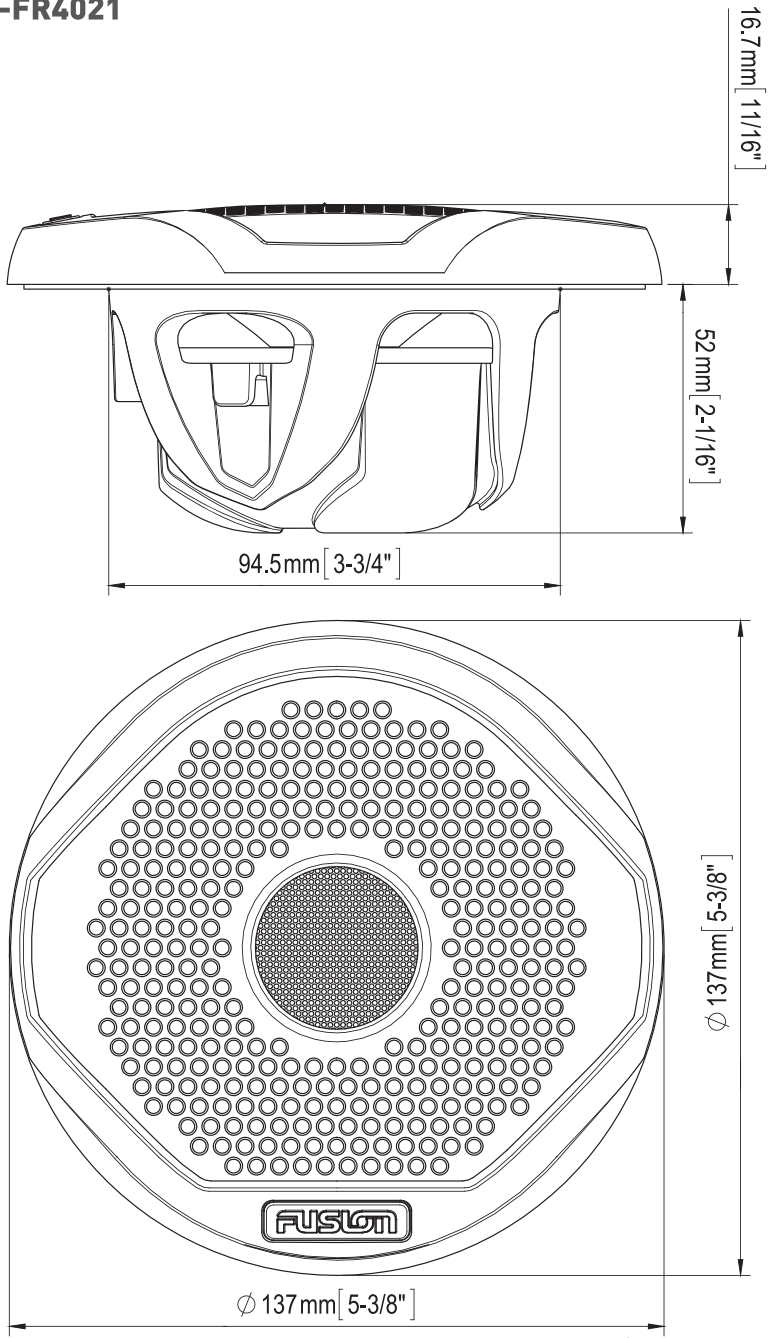
## PRODUCT SPECIFICATIONS

	MS-FR4021	MS-FR6021	MS-FR7021
<b>Tweeter Type</b>	Titanium Dome	Titanium Dome	Titanium Dome
<b>Max Power (watts)</b>	120	200	260
<b>Efficiency (1W/1M)</b>	87db	90db	91db
<b>Frequency Response</b>	90 – 22kHz	70 – 22kHz	60 – 22kHz
<b>Min. Mounting Depth Allowing Clearance (mm/in)</b>	54mm [2-1/8"]	71.5mm [2-13/16"]	78mm [3-1/16"]
<b>Impedance</b>	4 ohms	4 ohms	4 ohms

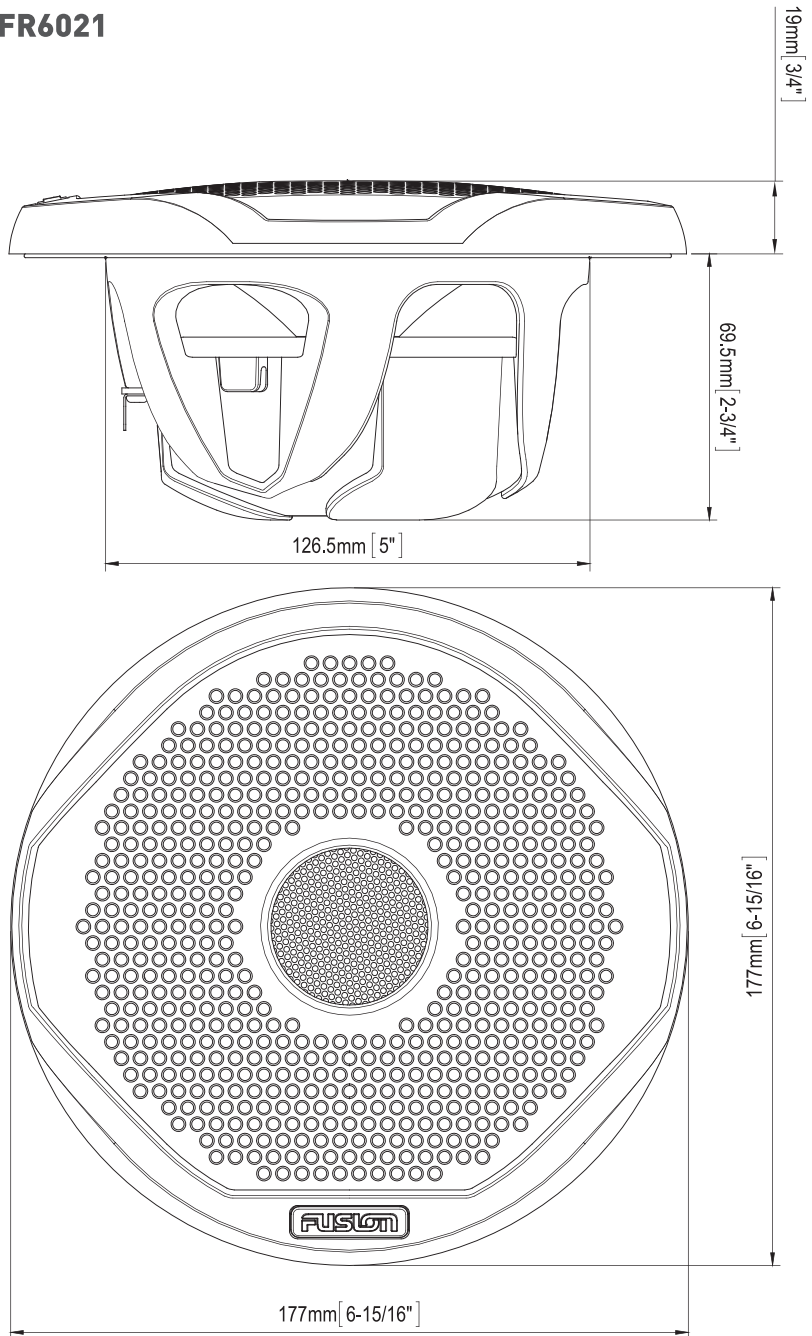
**CAUTION:** For speaker mounting restrictions, please refer to manufacturers recommendations for any related navigational equipment.

# LINE DRAWINGS AND DIMENSIONS

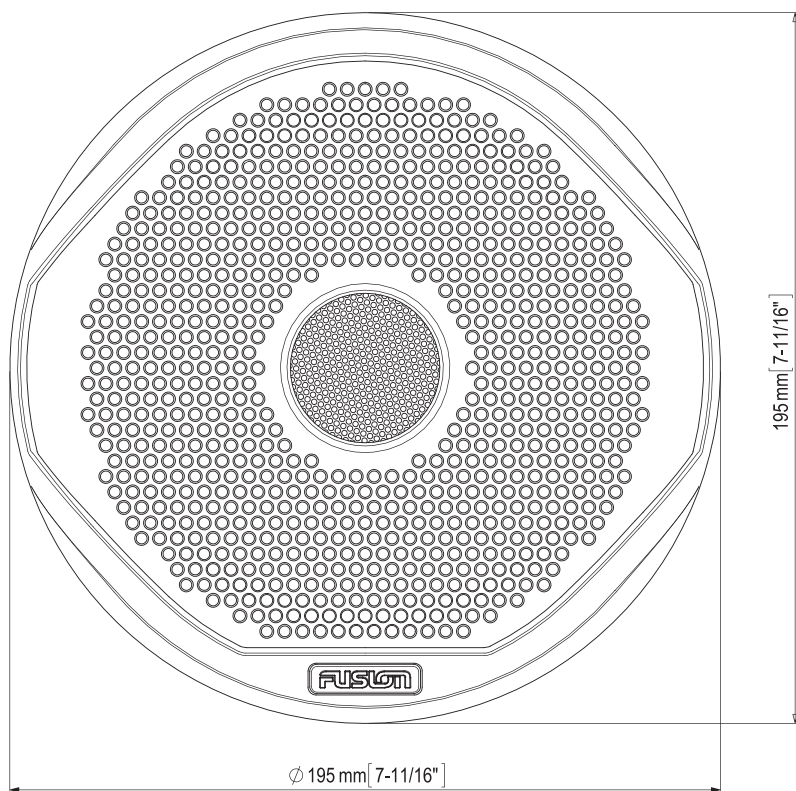
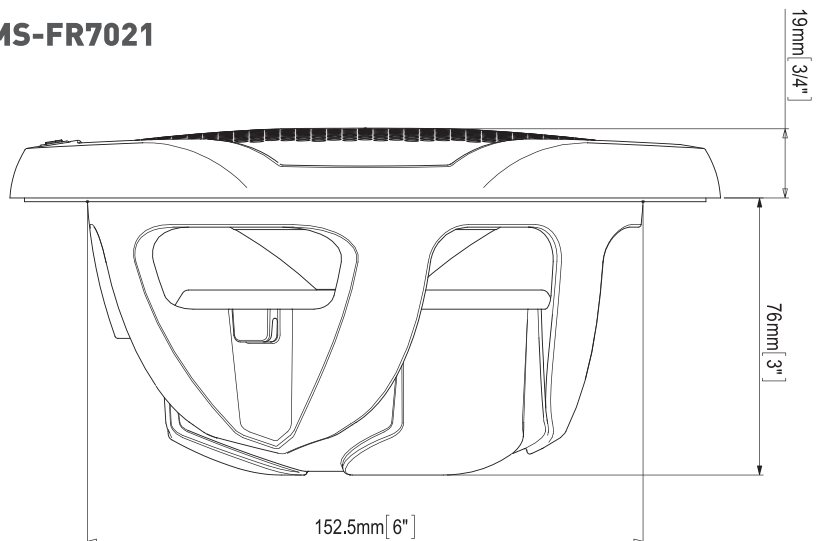
**MS-FR4021**



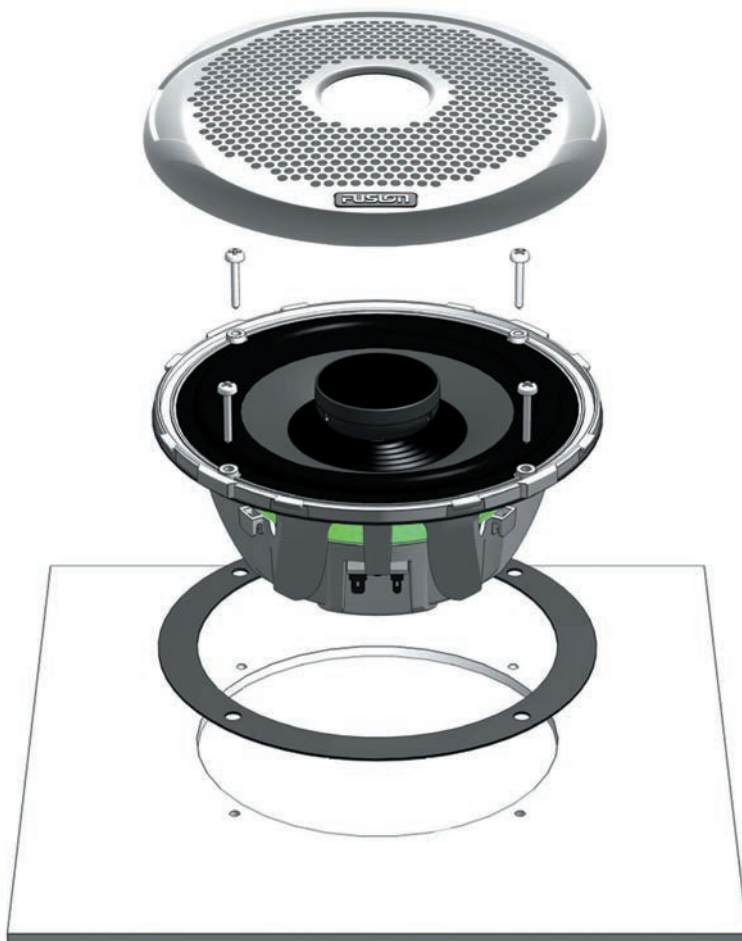
# MS-FR6021



# MS-FR7021



## LINE DRAWINGS AND DIMENSIONS



1. Check clearance around the mounting area before installation, ensuring the area is free from obstruction, and there is adequate depth for the speaker.
2. Check that the area chosen for mounting the speaker is flat. If the area is curved, it may not be possible to fit the speaker without "twisting" the frame.
3. If the installation area is only slightly curved, use the extra thick closed cell foam gasket provided.
4. Using the supplied mounting template, mark the correct diameter on the mounting surface.

5. Use a suitable cutting tool to remove the marked surface, and drill four holes for the screws to pass through.

**NOTE:** Confirm you are happy with badge position relative to mounting holes

6. Connect the wires before mounting the speaker. Be sure to observe the correct polarity.
7. With the grille removed, mount the speaker using the four stainless steel screws. DO NOT over tighten the screws, especially if the mounting area is not flat.
8. Twist the grille into position.

## INSTALLATION TIPS

Any speaker will only perform to its best capabilities, when correctly placed in the listening area. FUSION Engineers recognise that unlike a home or motor vehicle installation, there are an extremely wide range of marine environments where speakers may be placed. FUSION Full Range Marine Speakers are optimised to perform in the widest possible range of mounting locations, but a little thought and care with placement will always be rewarded with better sound.

- High frequencies are directional. Placing the speakers low down in the boat will lose some of this information. (To improve dispersion of the high frequencies, the grille on your FUSION Full Range Speaker has a uniquely designed "phase correction" feature in the centre, for best performance with the grille on.)
- Speakers should be placed to simulate a "sound stage", by being placed where you are able to hear both speakers in a stereo situation.
- Bass is dependant on the area behind the speaker. Too small an area will restrict bass, too large will compromise bass performance.
- Placing a speaker such that it is very close to an open area (where sound from the back of the loudspeaker has a very short path to compete with sound from the front of the loudspeaker) produces the least bass.
- If possible, try and make the area behind a speaker an enclosure.

Where the speaker is directly exposed to the outside environment, it is best if this is a sealed enclosure. (Especially if the loudspeaker is exposed to "wash down", as a vent might allow water to collect in the enclosure.)

Where the speaker is not so exposed (an inside cabin for instance), a better bass performance can be had if the enclosure is a ported or vented type. To help you achieve the best possible result see the optimum enclosure design recommendations. These are by volume only, and for the ported option, an optimum vent size/length is given.

## OPTIMUM ENCLOSURE RECOMMENDATIONS

	MS-FR4021	MS-FR6021	MS-FR7021
<b>Sealed Enclosure Volume (cu.ft)</b>	0.07	0.43	0.71
<b>Sealed Enclosure Volume (litres)</b>	2	12	20
<b>Ported Enclosure Volume (cu.ft)</b>	.34	0.9	1.25
<b>Ported Enclosure Volume (litres)</b>	9.5	26	36
<b>Port diameter (mm/in)</b>	50mm (2")	50mm (2")	60mm (2 7/16")
<b>Port length (mm/in)</b>	88mm (3 7/16")	25mm (1")	30mm (1 1/8")

## TROUBLE SHOOTING

Before you contact your FUSION dealer or service centre, FUSION requires that you do some simple trouble shooting to help diagnose the problem.

If the FUSION speaker has been installed by a professional installation company, then we recommend that you return to the company so the technician can assess the problem and advise.

Problem	Solution
<b>No sound</b>	Check all connections from the source unit and amplifier to the speaker terminals are correctly connected
<b>System lacks in bass</b>	Check the connections from the source unit/amplifier to the speaker. Ensure the positive wire from the source is connected to the positive of the speaker. Ensure the speakers are mounted firmly to the mounting surface
<b>System lacks in high frequencies</b>	Check polarity
	Check the bass / treble control settings on the source unit
<b>Distorted sound</b>	Check all wiring
	Check that it is not the surrounding panels of the craft rattling. Check connections from the source to the speaker.

## SPEAKER GRILLE OPTIONS

FUSION Marine Speakers (with the exception of MS-FR402) feature two grille options, allowing you to customise your speakers to match or enhance the appearance of your craft. Each pair of MS-FR6021 and MS-FR7021 speakers include a choice of two colours (Ice white and midnight black).

**NOTE:** MS-FR4021 only feature the ice white grille option

### **ICE WHITE AND MIDNIGHT BLACK GRILLES**

The ice white grilles are factory-fitted to the speakers with the midnight black grille options provided in the box (MS-FR6021 & MS-FR7021 only), and offer a high level of protection. FUSION recommends using these grilles in high traffic areas, or where objects are liable to be moving around or knocking into the speakers.

### **RECOMMENDED ACCESSORY**

For unique styling of your FUSION marine speaker installation, FUSION recommends the addition of the MS-FR6021GS / MS-FR7021GS chrome finished speaker grille. The chrome grille adds an impressive, sports styled impression to your installation for stand out appeal.

MS-FR6021GS compatible with MS-FR6021

MS-FR7021GS compatible with MS-FR7021

### **CARE AND MAINTENANCE**

As with all products with a chrome finish exposed to the harsh marine environment, a little care will help preserve the finish and prevent corrosion. FUSION recommends that you clean any salt water and/ or salt residue from the speaker grille with a damp cloth soaked in fresh water.