XS Series Speakers Installation Instructions

Important Safety Information

You must read all installation instructions before beginning the installation.

What's In the Box

- 2 speakers
- 12 Phillips stainless steel mounting screws
  - 4 in. models: 3.5 mm x 25.4 mm (6 gauge x 1 in.)
  - 6.5 in. and 7.7 in. models: 4.2 mm x 25.4 mm (8 gauge x 1 in.)
- Mounting template
- Speaker grilles

Tools Needed

- Electric drill
- Drill bit (size varies based on surface material)
- Phillips screwdriver
- Wire strippers
- Crimping tool
- Electrical tape
- Appropriate saw or utility knife to cut surface material
- Marine sealant (optional)

NOTE: For customized installations, additional tools and materials may be needed.

Mounting Considerations

NOTICE

When mounting the speaker in an area exposed to weather or water, you must mount the speaker on a vertical surface. If you mount the speaker on a horizontal surface facing up, water can gather in and around the speaker, causing damage over time.

Selecting the correct mounting location is critical to optimize the performance of each speaker. FUSION® speakers are designed to perform in the widest possible range of mounting locations, but the more you plan the installation, the better the speakers' sound will be.

- For the best performance, you should mount the speakers higher in the boat. Sound travels in the direction in which the speakers are facing, so if you mount them in a lower location, the sound quality and volume may not be not ideal.
- If you intend to mount the speakers outside the boat, you must mount them in a location well above the waterline, where they are not submerged or damaged by docks, pilings, or other pieces of equipment. When mounted correctly, these speakers are rated IP65 for protection from the front of the speaker. Water exposure and damage to the rear of the speaker voids the warranty. This includes situations when the speakers are mounted in a sealed enclosure, especially if they are exposed to wash down. Using an enclosure with a port or vent exposed to the outside environment may allow water to collect and damage the speaker.
- You should select mounting locations that enable you to hear sound from both speakers at the same time to achieve a sound stage effect. To achieve this effect, you should not mount the speakers side-by-side.
- When possible, you should select mounting locations where the area behind each speaker is enclosed.
- You must select mounting locations that provide sufficient clearance for the mounting depth of the speakers as specified in the product specifications.
- For better bass performance, you should select mounting locations that provide the appropriate space behind the speaker according to the optimum enclosure design requirements in the specifications section. Too small an area restricts bass, and too large an area compromises bass performance. Also, mounting a speaker close to an open area (where sound from the back of the speaker has a very short path to compete with sound from the front of the speaker) produces the least bass.
- When a speaker is not exposed to the outside environment, you can achieve a better bass performance using an enclosure with a ported design.
- You can reference the Thiele Small (T/S) parameters in the specifications section when designing a custom enclosure for the speakers.
- You should select a flat mounting surface for the best seal.
- You should protect the speaker wires from sharp objects and always use rubber grommets when wiring through panels.
- You should select mounting locations that avoid potential obstacles, such as fuel and hydraulic lines and wiring.
- You should protect all terminals and connections from grounding and from each other. Failure to do so could result in permanent damage to the audio system and void the product warranty.
- To avoid interference with a magnetic compass, you should not mount the speakers closer to a compass than the compass-safe distance value listed in the product specifications.
- You must turn off the audio system before making any connections to the source unit, amplifier, or speakers. Failure to do so could result in permanent damage to the audio system.
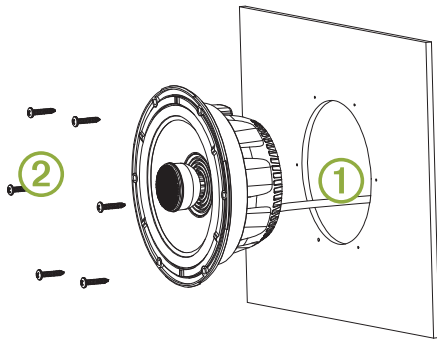
Mounting the Speakers

Before mounting the speakers, you must choose a location following the guidelines above.

Before cutting the mounting surface you should verify that there is enough clearance for the speaker behind the surface. Refer to the specifications for clearance information.

NOTICE

Do not apply grease or lubricant to the screws when fastening the speakers to the mounting surface. Grease or other lubricants can cause damage to the speaker housing.

1. Route the wires from the source to the speaker location, away from sources of electrical interference.
2. Trim the template and make sure it fits in the selected location.
3. Orient the template so that the FUSION logo is right-side up on the template.
4. Secure the template to the selected location.
5. Using a rotary tool or jigsaw, cut the mounting surface along the inside of the line on the template.
6. Place the speaker in the cutout to test the fit.
7. If necessary, use a file and sandpaper to refine the size of the cutout.
8. After the speaker fits correctly in the cutout, ensure the mounting holes on the speaker line up with the pilot holes on the template.
9. If the mounting holes on the speaker do not line up, mark the new hole locations.
10. Using an appropriately sized drill bit for the mounting surface and screw type, drill the holes.
11. Remove the template from the mounting surface.
12. Connect the speaker wires ① while observing polarity (*Speaker Wiring*, page 3).

13. If necessary, connect the LED wires (*LED Wiring*, page 3).
14. Place the speaker in the cutout.
15. Secure the speaker to the mounting surface using the included screws ②.

    NOTE: Do not over tighten the screws, especially if the mounting surface is not flat.

16. With the speakers mounted, hold the grille with the FUSION logo at the bottom, or at the 6 o'clock position.
17. Turn the grille counter-clockwise about 30 degrees, so the FUSION logo is at the 5 o'clock position.
18. Place the grille on the speaker, and twist it clockwise to secure it.

    NOTE: Instead of twisting to install the grille, you can line it up so the FUSION logo is at the 6 o'clock position and press to snap it into place.

Speaker Wiring

When connecting the speakers to your stereo, observe these considerations.

- Speaker wire is not included with the speakers. You should use 18 AWG (0.82 mm^2) speaker wire to connect the speakers to the stereo.
- The leads on the speakers are terminated using male spade connectors. You should use female spade connectors (not included) to connect the speaker wire to the speaker leads for the best connection.
- You can use this table to identify the polarity and spade-connector sizes of the leads on the speaker.

Speaker wire color	Speaker wire polarity	Spade connector size
White	Positive (+)	6.3 mm
White with a black stripe	Negative (-)	4.8 mm

LED Wiring

Connecting the LED Wires

You can control the color of the LEDs by connecting the LED color wires to ground. You can splice the ground wire to multiple LED wires to customize the LED color.

NOTE: This feature is available only on the sports model.

NOTE: Instead of connecting the LED wires for one dedicated color, you can install a remote control to turn the LEDs on and off, change the color, and create lighting effects.

The black wire on the LED cable is terminated with a 4 mm female bullet connector, and the color wires are terminated with 4 mm male bullet connectors. You can connect these to 4 mm bullet connectors on your wires (not included), or remove the bullet connectors to connect to the bare wires instead.

1. Connect a positive wire to the black wire on the LED cable.
2. Connect a ground wire to the wire on the LED cable

   according to the preferred LED color.

LED Color	LED Wire Color
Red	Red
Green	Green
Blue	Blue
Yellow	Red and green
Magenta	Red and blue
Cyan	Blue and green
White	Red, green, and blue

3. Route the positive and negative wires, and connect them to a power source (*Connecting the LED Wires to Power*, page 3).

Connecting the LED Wires to Power

NOTE: This feature is available on only the sports model.

You must connect all 12 Vdc wiring to the LEDs to a 3 A fuse at the power-source end of the cable. You should connect the positive (+) power wire to a 12 Vdc power source through an isolator switch or circuit breaker to turn the LEDs on and off. You can use the same isolator or circuit breaker controlling the power supply to your stereo, which allows you to turn the LEDs and the stereo on and off at the same time.

You should use 22 AWG (0.33 mm^2) or thicker wire to connect the LEDs to the battery.

1. Route the positive power (+) and negative ground (-) wires from the LED-wire connections to the battery.
2. Connect the negative wire to the negative (-) battery terminal.
3. Connect the positive wire to the positive (+) terminal through a 3 A fuse and isolator switch or circuit breaker.

Speaker Information

True-Marine™ Products

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

Any product that bears the True-Marine stamp of assurance has been designed for simplicity of use and combines advanced marine technologies to deliver an industry leading entertainment experience. All True-Marine products are supported by the FUSION 3-year worldwide limited consumer warranty.

Registering Your XS Series

Help us better support you by completing our online registration today.

- Go to website.
- Keep the original sales receipt, or a photocopy, in a safe place.

Cleaning the Speakers

NOTE: When mounted correctly, these speakers are rated IP65 for dust and water ingress protection under normal conditions. They are not designed to withstand high pressure water spray, which may occur when you wash down your vessel. Failure to carefully spray-clean the vessel may damage the product and void the warranty.

NOTICE

Do not use harsh or solvent-based cleaners on the speakers. Using such cleaners may damage the product and void the warranty.

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1 Clean all salt water and salt residue from the speaker with a damp cloth soaked in fresh water.
2 Use a mild detergent to remove a heavy buildup of salt or stains.

Troubleshooting

Before you contact your FUSION dealer or service center, you should perform a few simple troubleshooting steps to help diagnose the problem.

If the FUSION speaker has been installed by a professional installation company, you should contact the company so the technicians can assess the problem and advise you about possible solutions.

There is no sound coming from the speakers

- Verify that all connections from the source device and/or the amplifier are connected correctly to the speaker terminals.

The system lacks bass or high frequencies

- Verify that the correct wire polarity is observed between the source and speakers.

  The wires should be connected positive to positive and negative to negative.
- Verify that the speakers are attached firmly to the mounting surface.

The audio is distorted

- Verify that the source volume is not too loud for the speaker, and reduce the volume if necessary.
- Verify that the panels surrounding the speaker on the vessel are not rattling.
- Verify that the source device and/or the amplifier are connected to the speaker terminals correctly.
- If the speaker is connected to an amplifier, verify that the input level of the amplifier is matched to the output level of the stereo. For more information, see the manual for the amplifier.

The LED lights will not turn on

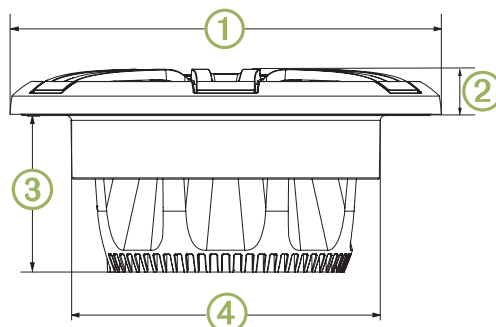- Verify that all wiring connections are correct and tight.

Specifications

Specification	4" Speakers	6.5" Speakers	7.7" Speakers
Peak power (Watts)	120 W	200 W	240 W
RMS power (Watts)	30 W	50 W	60 W
Efficiency (1 W/1 m)	87 dB	91 dB	92 dB
Frequency response	100 Hz to 18,000 Hz	80 Hz to 18,000 Hz	70 Hz to 18,000 Hz
Nominal impedance	4 ohms		
Recommended amplifier power (RMS)	15 to 80 W per channel	20 to 150 W per channel	25 to 200 W per channel
Min. mounting depth (clearance)	54 mm (2 $\frac{1}{8}$ in.)	67 mm (2 $\frac{5}{8}$ in.)	77 mm (3 in.)
Mounting diameter (clearance)	99 mm (3 $\frac{7}{8}$ in.)	135 mm (5 $\frac{5}{16}$ in.)	162 mm (6 $\frac{3}{8}$ in.)
Optimum enclosure volume recommendation*	4 L (0.14 ft.^{3})	8 L (0.28 ft.^{3})	10 L (0.28 ft.^{3})
LED color options (Sports Model Speakers only)	N/A	RGB	
LED Supply Voltage (Sports Model Speakers only)	N/A	From 10.8 to 16 Vdc	
LED Load Current at 14.4 Vdc (Sports Model Speakers only)	N/A	150 mA	
Operating temperature range	From 0 to 50°C (from 32 to 122°F)		
Storage temperature range	From -20 to 70°C (from -4 to 158°F)		
Cone/surround material	Polypropylene cone, rubber surround	Polypropylene cone, cloth surround	
Water and dust rating	IEC 60529 IP65 (Protected against dust and water ingress.)		

*Sealed enclosure, fully filled with absorption material.

NOTE: This speaker is not intended to be installed in a vented or ported enclosure when exposed to the outside environment.

Speaker Dimensions

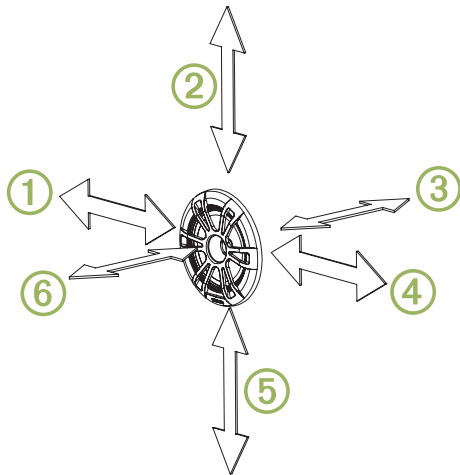| Dimension	4" Speakers	6.5" Speakers	7.7" Speakers
①	135 mm (5 $\frac{5}{16}$ in.)	177 mm (6 $\frac{15}{16}$ in.)	196 mm (7 $\frac{11}{16}$ in.)
②	Classic grille: 17 mm ($\frac{11}{16}$ in.)	Classic grille: 17 mm ($\frac{11}{16}$ in.) Sports grille: 19 mm ($\frac{3}{4}$ in.)	Classic grille: 20 mm ($\frac{3}{4}$ in.) Sports grille: 23 mm ($\frac{7}{8}$ in.)
③	51 mm (2 in.)	64 mm (2 $\frac{1}{2}$ in.)	74 mm (2 $\frac{7}{8}$ in.)
④	95 mm (3 $\frac{3}{4}$ in.)	130 mm (5 $\frac{1}{8}$ in.)	157 mm (6 $\frac{3}{16}$ in.)

Compass-Safe Distances

All speakers contain magnets which may cause interference with instruments on your boat. The size of the magnet used in the speaker affects how much interference the speaker may cause.

Interference can cause deviations and variations in the readings of sensitive navigational equipment, such as magnetic compasses. These deviations can cause inaccuracies or offsets in the readings, but will not harm the equipment. To alleviate the deviations, adjust the compass for the deviation following the manufacturer's instructions or move the speaker away from the navigational equipment. After moving a source of interference, you may need to recalibrate the compass.

If you are navigating solely by a magnetic compass, use extreme caution to place the speaker far enough away from the compass to avoid causing deviations in the readings.

To avoid deviations to navigational equipment, position the speakers so they are separated from the navigational equipment by at least the distance listed in the table below.

Direction from Speaker	4" Speakers	6.5" Speakers	7.7" Speakers
①	185 cm (6 ft. 1 in.)	250 cm (8 ft. 2 in.)	275 cm (9 ft.)
②	185 cm (6 ft. 1 in.)	245 cm (8 ft.)	275 cm (9 ft.)
③	255 cm (8 ft. 5 in.)	310 cm (10 ft. 2 in.)	400 cm (33 ft. 4 in.)
④	185 cm (6 ft. 1 in.)	255 cm (8 ft. 4 in.)	275 cm (9 ft.)
⑤	185 cm (6 ft. 1 in.)	230 cm (7 ft. 6 in.)	275 cm (9 ft.)
⑥	230 cm (7 ft. 7 in.)	280 cm (9 ft. 2 in.)	385 cm (12 ft. 7 in.)

Thiele Small Parameters

You can use the Thiele Small (T/S) parameters when designing custom enclosures for your speakers.

NOTE: Thiele/Small parameters may vary between samples, based on the environment and how much the speaker has been used. These values are intended as a guide to help with enclosure design.

T/S Parameter	4 in. Speakers	6.5 in. Speakers	7.7 in. Speakers
Electrical Q factor (Q_{es})	1.80	1.05	0.7
Mechanical Q factor (Q_{ms})	4.40	4.80	3.6
Total Q factor (Q_{ts})	1.28	0.86	0.59
Resonance frequency (F_s)	128	82	72
Equivalent air load (V_{as})	1.6	7.6	10.4