

GARMIN®

FUSION® XS SERIES SPEAKERS

Installation Instructions

Important Safety Information

⚠ WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

This device must be installed according to these instructions to avoid serious personal injury or possible property damage.

Disconnect the vessel's power supply before beginning to install this device to avoid serious personal injury or possible property damage.

⚠ CAUTION

It is strongly recommended that you have your audio system installed by a professional installer to ensure optimum performance and to avoid personal injury or property damage.

Continuous exposure to sound pressure levels over 100 dBA may cause permanent hearing loss. The volume is typically too loud if you cannot hear people speaking around you. Limit the amount of time you listen at high volume. If you experience ringing in your ears or muffled speech, stop listening and have your hearing checked.

To avoid possible personal injury, always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding.

NOTICE

When drilling or cutting, always check what is on the opposite side of the surface to avoid damaging the vessel.

You must read all installation instructions before beginning the installation. If you experience difficulty during the installation, go to support.garmin.com for product support.

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)
- Appropriate saw or utility knife to cut surface material
- Phillips screwdriver
- Wire strippers
- 16 AWG (1.3 through 1.5 mm²) marine-grade, fully-tinned copper speaker wire
You can purchase this wire from your Fusion® or Garmin® dealer:
 - 010-12899-00: 7.62 m (25 ft.)
 - 010-12899-10: 15.24 m (50 ft.)
 - 010-12899-20: 100m (328 ft.)
- 20 AWG (0.5 mm²) marine-grade, fully-tinned copper wire for LED connections
You can purchase this wire from your Fusion or Garmin dealer in 100m (328 ft.) lengths (010-13386-00).

- 6.3 mm and 4.8 mm female spade connectors (recommended)
- 4 mm male and female bullet connectors for the LED wires (recommended, LED models only)
- Crimping tool
- Marine sealant (optional)

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

Mounting Location and Water Resistance

WARNING

The front of the speaker is protected from water ingress. The rear of the speaker, including all connected components and wires, is not waterproof and must be protected against moisture exposure. Moisture exposure to the rear of the speaker can lead to speaker component failure which can cause a fire resulting in property damage, serious personal injury, or death.

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.

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 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 an 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 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.

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.

When selecting a mounting location for the speakers, observe these considerations:

- You must select a mounting location that protects the rear of the speaker from moisture exposure.
- You must select mounting locations that provide sufficient clearance for the mounting depth of the speakers as specified in the product specifications.
- You should select a flat, vertical mounting surface for the best seal.
- You should protect the speaker wires from sharp objects and always use rubber grommets when wiring through panels.
- 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.

Selecting the correct mounting location optimizes the performance of each speaker. The 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.

Mounting the Speakers

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

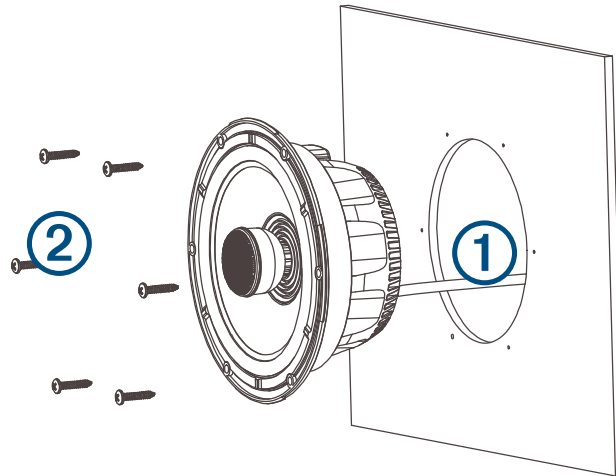
Before cutting the mounting surface you should verify that there is enough clearance for the speaker behind the surface. Refer to the specifications for clearance information.

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.

- 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 16 AWG (1.3 through 1.5 mm²) 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

NOTICE

Using certain LED colors on the speakers, such as red and green, may violate the laws, regulations, and standards related to the use and/or operation of marine navigation lights. It is the user's responsibility to comply with any such applicable laws, regulations, and standards. Garmin® is not responsible for any fines, penalties, citations, or damages that may be incurred due to any such lack of compliance.

It is recommended to connect the LEDs using marine LED cable (010-13386-00).

If connecting the marine LED cable to RGB or CRGB lighting, you should properly terminate any unused wires.

It is recommended to install an LED lighting controller module with these speakers to turn the LEDs on and off, change the colors, and create lighting effects. See your Fusion® dealer or garmin.com for more information.

You should follow the instructions provided with the LED controller to connect the LED wires from the speakers to the LED controller and to connect the controller to power. For information about proper fuse ratings for your speaker model, see [LED Fuse Installation, page 4](#).

If you choose not to install the LED controller, you can set the static color of the LEDs by connecting combinations of the LED wires directly to the power source ([Connecting the LED Wires, page 4](#)).

Connecting the LED Wires

If you choose to not install a remote control to turn the LEDs on and off, change the color, and create lighting effects, you can choose a static LED color by connecting specific LED color wires to ground. You can splice the ground wire to a combination of LED wires to customize the LED color beyond red, green, or blue.

NOTE: LEDs are not available on all models.

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.

NOTE: You must connect the positive wire through a fuse appropriate for your speaker model ([LED Fuse Installation, page 4](#)).

- 2 Connect a ground wire to the wire or the combination of wires on the LED cable according to the preferred LED color.

LED Color	LED Wire Color
Red	Red wire
Green	Green wire
Blue	Blue wire
Yellow	Combined red and green wires
Magenta	Combined red and blue wires
Cyan	Combined blue and green wires
White	Combined red, green, and blue wires

- 3 Route the positive and negative wires, and connect them to a power source ([Connecting the LED Wires Directly to Power, page 4](#)).

LED Fuse Installation

WARNING

You must install an inline fast-blow fuse on the positive wire at the power-source end of the LED cable for each speaker to protect the LEDs and the speaker from excessive electrical current. Failure to install a fuse could cause a fire resulting in property damage, serious personal injury, or death.

- The fuse must be installed in a fuse holder intended for marine use.
- The fuse must be installed on the positive wire on the power-source end of the LED cable.
- The fuse must be installed for use with any power source, including a lighting controller.
- Always use a fuse of the correct amperage rating and type for your speaker model.

Speaker Model	Fast-blow Fuse Rating
Fusion® XS Series 6.5 in. Speakers with LED Lighting	500 mA
Fusion XS Series 7.7 in. Speakers with LED Lighting	500 mA

Connecting the LED Wires Directly to Power

NOTE: LEDs are not available on all models.

You must connect all 12 Vdc wiring for the LEDs to 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. The fuse must be installed between the LED cable and the isolator switch or circuit breaker.

You should use 20 AWG (0.5 through .75 mm²) 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 the appropriate fuse (*LED Fuse Installation, page 4*) and an 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 Fusion Device

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

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

Cleaning the Speakers

NOTICE

When mounted correctly, the fronts of these speakers are protected against dust and water ingress under normal conditions. They are not designed to withstand high pressure water spray, which may occur when you wash down your vessel. High-pressure spray on the speakers may damage the product and void the warranty.

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

- 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

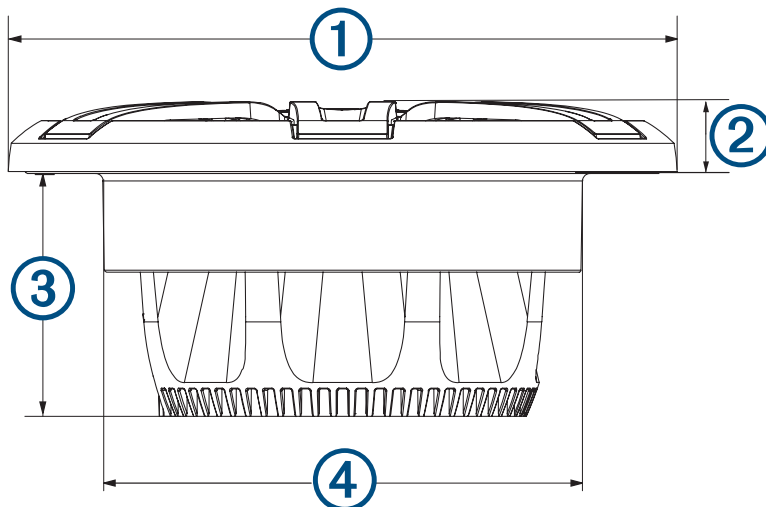
Specification	4" Speakers	6.5" Speakers	7.7" Speakers
Peak power (Watts)	120 W	200 W	240 W
RMS power (Watts)	30 W	50 W	60 W
Efficiency (1 W/1 m)	87 dB	91 dB	92 dB
Frequency response	100 Hz to 18,000 Hz	80 Hz to 18,000 Hz	70 Hz to 18,000 Hz
Nominal impedance	4 ohms		
Recommended amplifier power (RMS)	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 1/8 in.)	67 mm (2 5/8 in.)	77 mm (3 in.)
Mounting diameter (clearance)	99 mm (3 7/8 in.)	135 mm (5 5/16 in.)	162 mm (6 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	120 mA per color per speaker	150 mA per color per speaker
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.

NOTICE

This speaker is not intended to be installed in a vented or ported enclosure when exposed to the outside environment. Mounting the speaker in a vented or ported enclosure may result in corrosion and poor speaker performance.

Speaker Dimensions



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

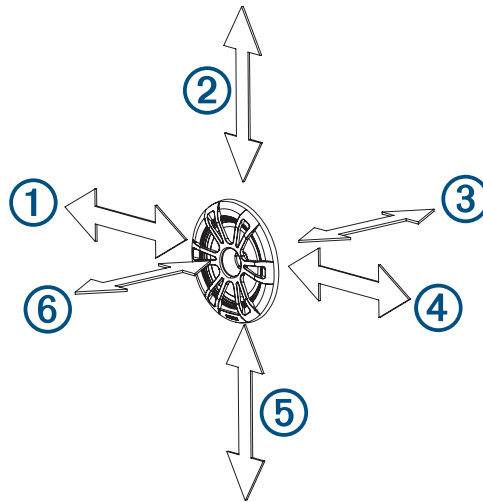
Compass-Safe Distances

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 (13 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

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