

GARMIN®



GMR FANTOM™ 18X/24X RADOME 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.

Failure to install this device according to these instructions could result in personal injury, damage to the vessel or device, or poor product performance.

The radar transmits electromagnetic energy. To avoid possible personal injury, damage to the vessel or device, or poor product performance, ensure that the radar is installed according to the recommendations in these instructions and that all personnel are clear of the path of the radar beam before transmitting. When properly installed and operated, the use of this radar conforms to the requirements of ANSI/IEEE C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields.

To avoid possible personal injury, do not look directly at the antenna at close range when the radar is transmitting. Eyes are the most sensitive part of the body to electromagnetic energy.

When connecting the power cable, do not remove the in-line fuse holder. To prevent the possibility of injury or product damage caused by fire or overheating, the appropriate fuse must be in place as indicated in the product specifications. Connecting the power cable without the appropriate fuse in place voids the product warranty.

⚠ CAUTION

For the best possible performance and to avoid potential injury, damage to the device, or damage to your vessel, installation by a qualified marine installer is recommended.

Opening the device may result in personal injury and/or damage to the device. This device contains no user-serviceable parts, and should be opened only by a Garmin® authorized service technician. Any damage resulting from opening the unit by anyone other than a Garmin authorized service technician will not be covered by the Garmin warranty.

This device should be used only as a navigational aid. Using the device for any purpose requiring precise measurement or direction, distance, location, or topography may result in personal injury or damage to the vessel.

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.

Software Update

You must update the Garmin chartplotter software when you install this device. For instructions on updating the software, see your chartplotter owner's manual at support.garmin.com.

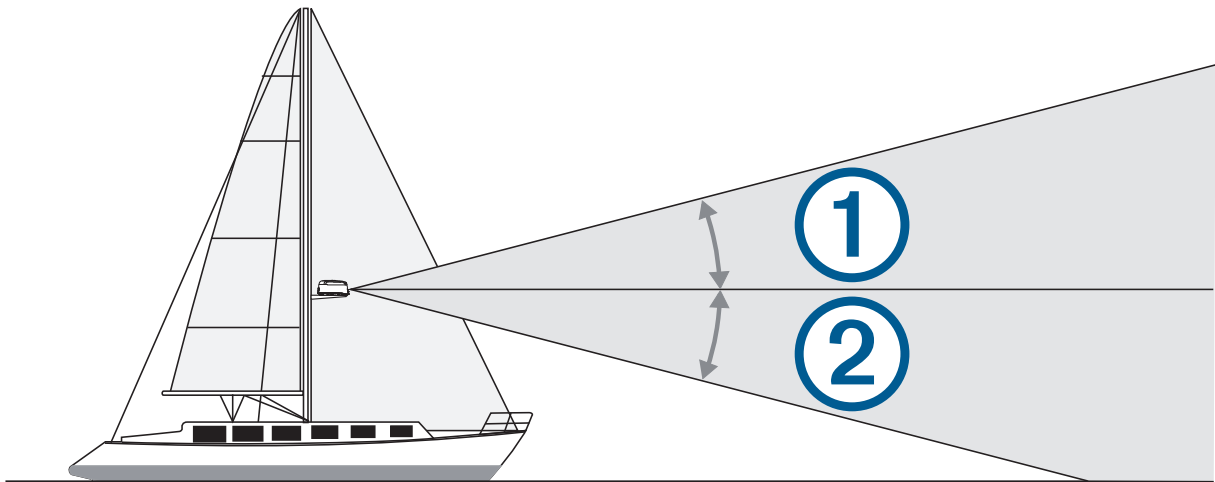
Tools Needed

- Drill
- 9.5 mm ($\frac{3}{8}$ in.) drill bit
- 32 mm ($1\frac{1}{4}$ in.) drill bit (optional)
- 4 mm ($\frac{5}{32}$ in.) hex wrench
- 13 mm ($\frac{1}{2}$ in.) wrench and torque wrench
- Marine sealant

Mounting Considerations

To complete the installation, you need the appropriate fasteners, tools, and mounts. These items are available at most marine dealers.

- It is highly recommended that the device is mounted out of range of personnel, with the horizontal beam width above head height. To avoid exposure to harmful radio frequency (RF) levels, the device should not be mounted closer to people than the maximum safe distance value listed in the product specifications.
- The device should be mounted high above the ship's keel line with minimal blockage between the vessel and the radar beam. Obstructions may cause blind and shadow sectors, or generate false echoes. The higher the installation position, the farther the radome can detect targets.
- The device should be mounted on a flat surface or a platform that is parallel to the vessel's water line and is sturdy enough to support the device's weight. The weight for each model is listed in the product specifications.
- Most radar beams spread vertically 12.5° above ① and 12.5° below ② the radome's radiating element. On vessels with higher bow angles at cruise speed, the installation angle can be lowered to point the beam slightly downward to the waterline while at rest. Use shims if necessary.



- The device should be mounted away from heat sources such as smoke stacks and lights.
- The device should be mounted at a different level than horizontal spreaders and mast crosstrees.
- To avoid interference with a magnetic compass, the device should not be mounted closer to a compass than the compass-safe distance value listed in the product specifications.
- Other electronics and cables should be mounted more than 2 m (6 ½ ft.) from the radar beam path.
- GPS antennas should be either above or below the radar beam path.
- The device should be mounted at least 1 m (40 in.) from any transmitting equipment.
- The device should be mounted at least 1 m (40 in.) away from cables carrying radio signals such as VHF radios, cables, and antennas.

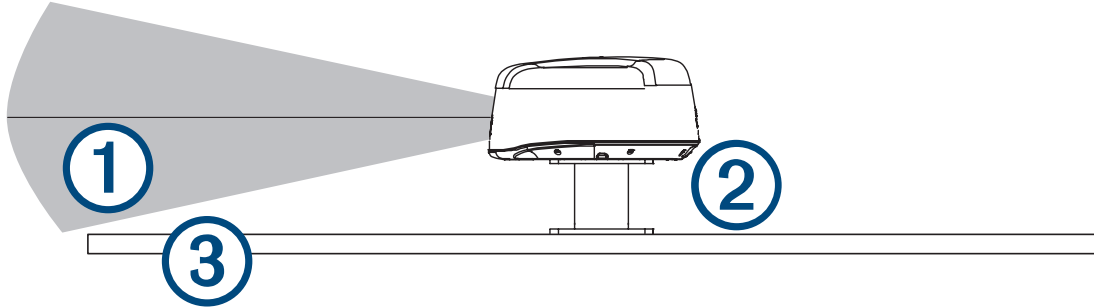
For Single Side Band (SSB) radios, increase the distance to 2 m (6 ½ ft.).

Roof Mounting Considerations

NOTICE

If you are mounting the radar on a roof or hard top of your boat, you may need to raise the installation height using a pedestal or other suitable structure to avoid a negative impact on performance. Mounting the radar directly on a hard top could cause the transmitted energy to be reflected or absorbed by the surface. If the surface is metal, this is particularly important to avoid.

The beam transmitted by this radar spreads vertically 12.5 degrees from the horizontal mid line ①, and you should raise the dome ② so the beam clears the edge of the roof or hard top ③.

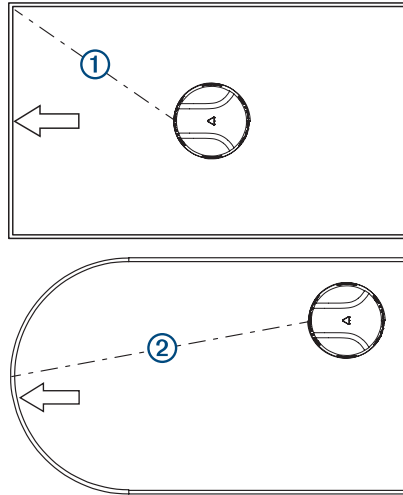


Determining the Radar Mounting Height

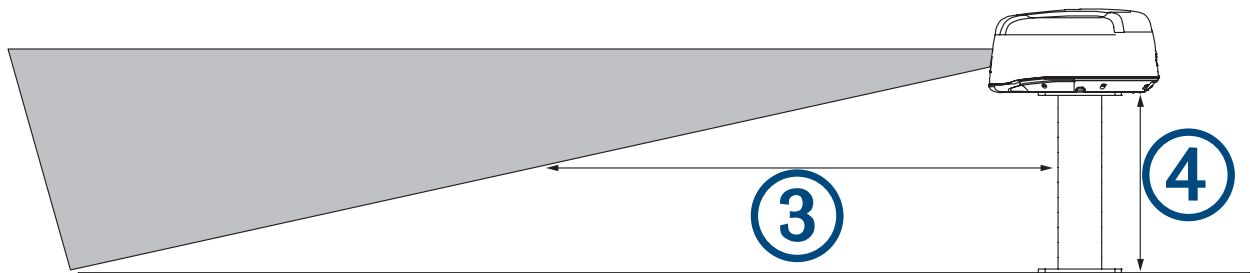
NOTICE

If you plan to install the radar on a roof or hard top, you should install it high enough to avoid interference from the surface.

- 1 Based on the shape of the roof, complete an action:
 - Measure the distance from the intended mounting location to the furthest front corner of a rectangular roof ①.
 - Measure the distance from the intended mounting location to the front apex of a curved roof ②.



- 2 Use this equation to determine the mounting height of the radar based on the distance you measured in the previous step:



$$(\text{Distance (mm)} \text{ ③} \times 0.222) - 150 = \text{height (mm)} \text{ ④}$$

$$(\text{Distance (in.)} \text{ ③} \times 0.222) - 6 = \text{height (in.)} \text{ ④}$$

For example, if the mounting location is 2 m (6.6 ft.) from the corner of the roof, this is how you would complete the equation to determine the mounting height after converting to mm (or in.):

$$(2000 \text{ mm} \times 0.222) - 150 = 294 \text{ mm}$$

$$(78 \text{ in.} \times 0.222) - 6 = 11.3 \text{ in.}$$

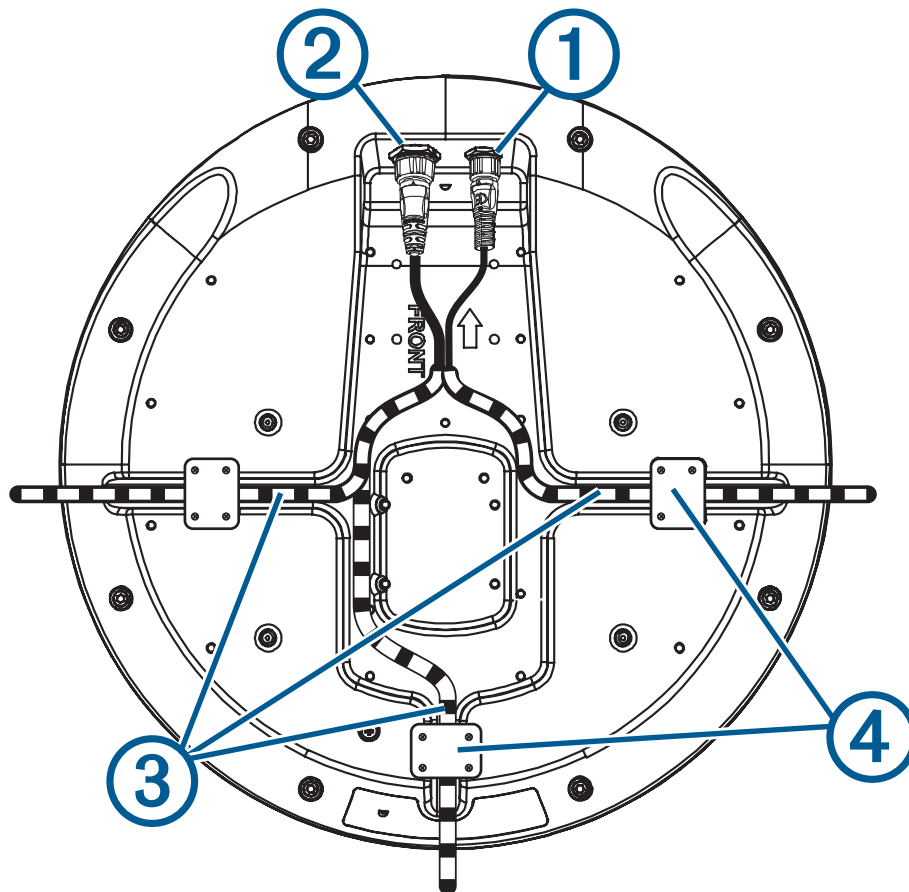
- 3 Install a riser or other fixture so the base of the radar is equal to or higher than the distance you calculated in the previous step.

Mounting the Radar

Before you mount the radar, you must review the mounting location considerations and select a mounting location.

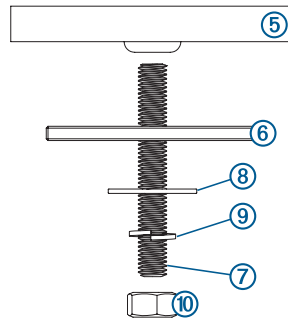
NOTE: The supplied M8 x 1.25 x 60 threaded rods can be used on mounting thicknesses of 5 to 30 mm ($\frac{3}{16}$ to $1\frac{3}{16}$ in.) (recommended). For surfaces over 30 mm ($1\frac{3}{16}$ in.), use longer threaded rods.

- 1 If you are not installing the device on a pre-drilled Garmin compatible radar mount, use the included mounting template to drill four 9.5 mm ($\frac{3}{8}$ in.) mounting holes.
- 2 Connect the network cable to the network port ① and the power cable to the power port ②.



- 3 Press the cables into any of the guide grooves ③ on the bottom of the case, and secure them using a cable hold-down plate ④.
The cables should be bent or twisted as little as possible.
- 4 Using the arrow on the bottom as a reference, position the radome on the mounting surface aligned to the front of the vessel.
NOTE: If you choose not to align the dome with the front of the vessel, you can adjust the front-of-boat offset after the dome is installed ([Measuring and Setting the Front-of-Boat Offset](#), page 9).
- 5 Apply the included anti-seize compound to the threads of the four M8 x 1.25 x 60 threaded rods.
- 6 Insert the four threaded rods into the mounting holes on the bottom of the radome.
Up to 50 mm (2 in.) of the threaded rods may extend below the radome.
- 7 Apply a bead of marine sealant on the mounting surface around each mounting hole.

- 8 Fasten the radome ⑤ to the mounting surface ⑥ using the threaded rods ⑦, flat washers ⑧, spring washers ⑨, and hex nuts ⑩.



- 9 Using a torque wrench, tighten the nuts to 13.7 to 18.6 N-m (10 to 14 lbf-ft.).

Wiring and Connection Considerations

It may be necessary to drill 32 mm (1¹/₄ in.) holes for routing the cables.

You must apply marine sealant to the hole after the cables are in place to ensure a waterproof seal.

If you must make the routing hole in a visible location, 32 mm (1¹/₄ in.) decorative cable grommets can be purchased from your local Garmin dealer, or you can go to garmin.com/accessories/cable_grommets (optional).

- If needed, you can trim the grommet to enable you to route multiple cables through the same hole.
- The optional grommet does NOT provide a waterproof seal. You must apply marine sealant to the grommet after the cables are in place to ensure a waterproof seal.

When installing the cables, you should observe these considerations.

- To ensure safety, appropriate tie-wraps, fasteners, and sealant should be used to secure the cable along the route and through any bulkheads or the deck.
- You should not run cables near moving objects and high-heat sources, or through doorways and bilges.
- To avoid interference with other equipment, you should not run network and power cables parallel to other cables, such as radio antenna lines or power cables. If this is not possible, the cables should be shielded with metal conduit or a form of EMI shielding.
- You should install the power cable as close to the battery source as possible.
 - If it is necessary to extend the power cable, you must use the appropriate wire gauge (*Power Cable Extensions*, page 8).
 - Incorrectly extended runs of cable may cause the radar to malfunction due to insufficient power transmission.

Connecting the Power Cable

⚠ WARNING

When connecting the power cable, do not remove the in-line fuse holder. To prevent the possibility of injury or product damage caused by fire or overheating, the appropriate fuse must be in place as indicated in the product specifications. Connecting the power cable without the appropriate fuse in place voids the product warranty.

- 1 Route the power cable from the device to the power source.
- 2 Connect the red wire to the positive (+) battery terminal, and connect the black wire to the negative (-) battery terminal.
- 3 If you have not already done so, connect the power cable to the device by turning the locking ring clockwise.

Power Cable Extensions

Connecting the power cable directly to the battery is recommended. If it is necessary to extend the cable, the appropriate gauge of wire must be used for the length of the extension.

Distance	Wire Gauge
2 m (6.5 ft.)	16 AWG (1.31 mm ²)
4 m (13 ft.)	14 AWG (2.08 mm ²)
6 m (19.5 ft.)	12 AWG (3.31 mm ²)

Networking Considerations

This device uses Garmin BlueNet™ networking technology, and is compatible with both Garmin BlueNet devices and Garmin Marine Network devices. For more information about Garmin BlueNet technology, including best practices for constructing a network including both Garmin BlueNet devices and Garmin Marine Network devices, go to garmin.com/manuals/bluenet.

Before connecting this device to the network, observe the following considerations:

- If your boat is equipped with a Garmin BlueNet chartplotter, you should connect the GMR Fantom 18x/24x device to an open network port on the Garmin BlueNet chartplotter or the Garmin BlueNet 20 switch, using the included Garmin BlueNet cable.
- If your boat is equipped with a Garmin BlueNet chartplotter and uses a Garmin BlueNet 30 gateway to connect Garmin Marine Network devices, you should connect the GMR Fantom 18x/24x device to the Garmin BlueNet side of your network, if possible, for the best performance and to best support future updates.
- If your boat is equipped with only Garmin Marine Network devices, you must use the Garmin Marine Network adapter cable to connect the GMR Fantom 18x/24x device to your network. If a Garmin Marine Network adapter cable is not supplied in the product box, you can purchase one from your local Garmin dealer (part number 010-12531-01) or online at garmin.com/accessories/GMNAdapterCable.

Connecting to a Garmin BlueNet Network

- 1 Route the Garmin BlueNet cable to the GMR Fantom 18x/24x device and to your Garmin BlueNet chartplotter or Garmin BlueNet 20 switch.
- 2 Connect the Garmin BlueNet cable to the network port on the GMR Fantom 18x/24x device.
- 3 Connect the other end of the Garmin BlueNet cable to any open network port on your Garmin BlueNet chartplotter or the Garmin BlueNet 20 switch.
- 4 Tighten the locking rings on the connectors.

Connecting to a Garmin Marine Network

- 1 Route the Garmin BlueNet cable to the GMR Fantom 18x/24x device and to your Garmin Marine Network chartplotter or GMS™ 10 port expander.
- 2 Connect the Garmin BlueNet cable to the network port on the GMR Fantom 18x/24x device.
- 3 Connect the other end of the Garmin BlueNet cable to the Garmin Marine Network adapter cable.
- 4 Connect the Garmin Marine Network adapter cable to an open network port on your Garmin Marine Network chartplotter or the GMS 10 port expander.
- 5 Tighten the locking rings on the connectors.

Radar Operation

All functions of this radar are controlled with your Garmin chartplotter. See the Radar section of your chartplotter's owner's manual for operating instructions. To download the latest manual, go to support.garmin.com.

If you have more than one radar on your boat, you must be viewing the radar screen for the radar you want to configure.

Measuring and Setting the Front-of-Boat Offset

The front-of-boat offset compensates for the physical orientation of the radar scanner on a boat, if the radar scanner does not align with the bow-stern axis. The front-of-boat offset setting configured for use in one radar mode is applied to every other radar mode and to the radar overlay.

- 1 Using a magnetic compass, take an optical bearing of a stationary target located within viewable range.
- 2 Measure the target bearing on the radar.
- 3 If the bearing deviation is more than +/- 1 degree, set the front-of-boat offset.
- 4 From a radar screen, select **Options > Radar Setup > Installation > Front of Boat**.
- 5 Select **Up** or **Down** to adjust the offset.

Installation Troubleshooting

Symptom	Possible Causes
The radar does not turn on. The status LED is not on.	<ul style="list-style-type: none">• The power cable may not be connected correctly to the device or to the battery. Check all connections.• The inline fuse may have blown. Check the fuse and replace it if necessary.• The wire gauge used to extend the power cable may be too small for the length of the extension. Check the table provided in the Power Cable Extensions section of these instructions to make sure the correct wire gauge is used (Power Cable Extensions, page 8).
The radar is not available on the Garmin device or on devices connected to the Garmin BlueNet network or the Garmin Marine Network.	<ul style="list-style-type: none">• The radar may not be powering on. Check the status LED.• The device software may not be up-to-date. Update the software on the device or on the Garmin BlueNet network or the Garmin Marine Network.• The network cable may not be connected correctly to the device or to the Garmin BlueNet network or the Garmin Marine Network. Check all connections.• If a field-installable network connector was used, it may have been installed improperly. Check the connector.

The status LED is located on the product label, and can help troubleshoot installation problems.

Status LED Color and Activity	Radar Status
Solid red	The radar is getting ready for use. The LED should be solid red briefly and change to flashing green.
Flashing green	The radar is operating properly.
Flashing orange	The radar software is being updated.
Flashing red	The radar has encountered an error. Contact Garmin product support for assistance.

Contacting Garmin Support

- Go to support.garmin.com for help and information, such as product manuals, frequently asked questions, videos, and customer support.
- In the USA, call 913-397-8200 or 1-800-800-1020.
- In the UK, call 0808 238 0000.
- In Europe, call +44 (0) 870 850 1241.

Specifications

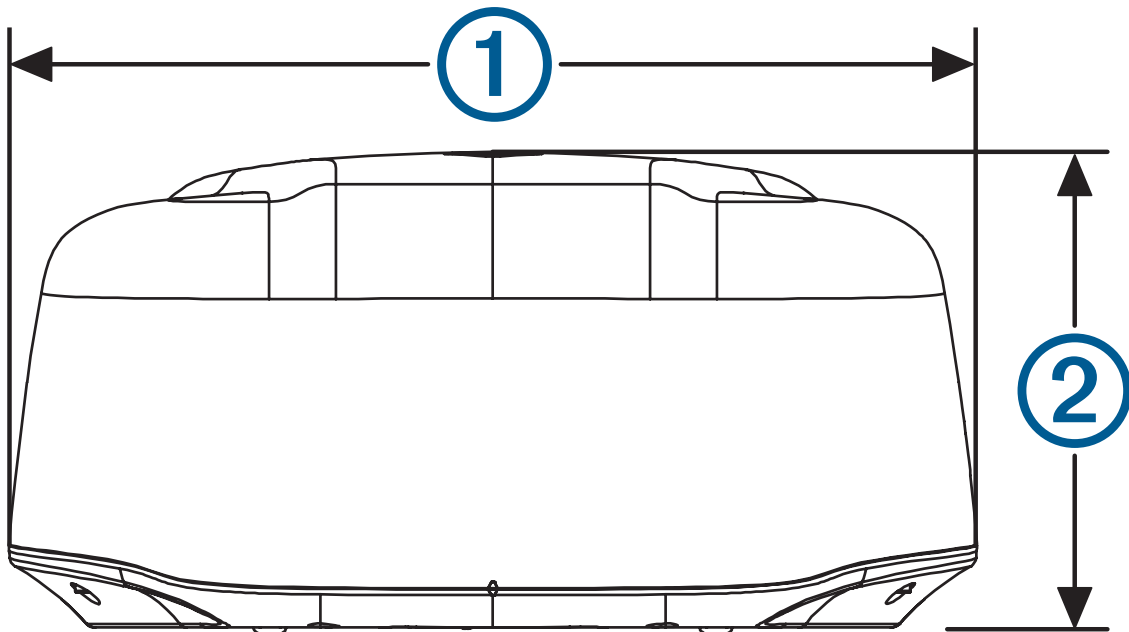
Specification	Measurement
Weight	GMR Fantom 18x: 6.35 kg (14 lb.) GMR Fantom 24x: 7.89 kg (17.4 lb.)
Operating temperature range	White dome: From -25 to 70°C (from -13 to 158°F) Black dome: From -25 to 55°C (from -13 to 131°F)
Minimum safe operating distance ¹	<ul style="list-style-type: none"> • 100 W/m² = 0.12 m (4.6 in.) • 50 W/m² = 0.17 m (6.5 in.) • 10 W/m² = 0.37 m (14.5 in.)
Input voltage	From 10 to 32 Vdc, 4 A max.
Case material	Thermoplastic resin
Maximum antenna rotation speed	60 RPM
Power output	50 W peak
Transmitter center frequency	From 9335 to 9455 MHz
Transmitter maximum bandwidth	40 MHz
Beam width	GMR Fantom 18x: 5.2 degrees GMR Fantom 24x: 3.7 degrees
Minimum range	6 m (20 ft.)
Maximum range	48 nautical miles
Power consumption ²	Standby: 4 W max. Transmitting: <ul style="list-style-type: none"> • Normal Mode, 33 W max. • Power Save Mode, 24 W max.
Fuse	7.5 A
Compass-safe distance	18x: 97 cm (38 in.) 24x: 89 cm (35 in.)

¹ When it is transmitting, the radar should be located in a position on the vessel that is at least this far from people. (IEC 60936-1, clause 3-27.1, specifies the maximum distances from the antenna at which radio frequency (RF) levels can be expected.)

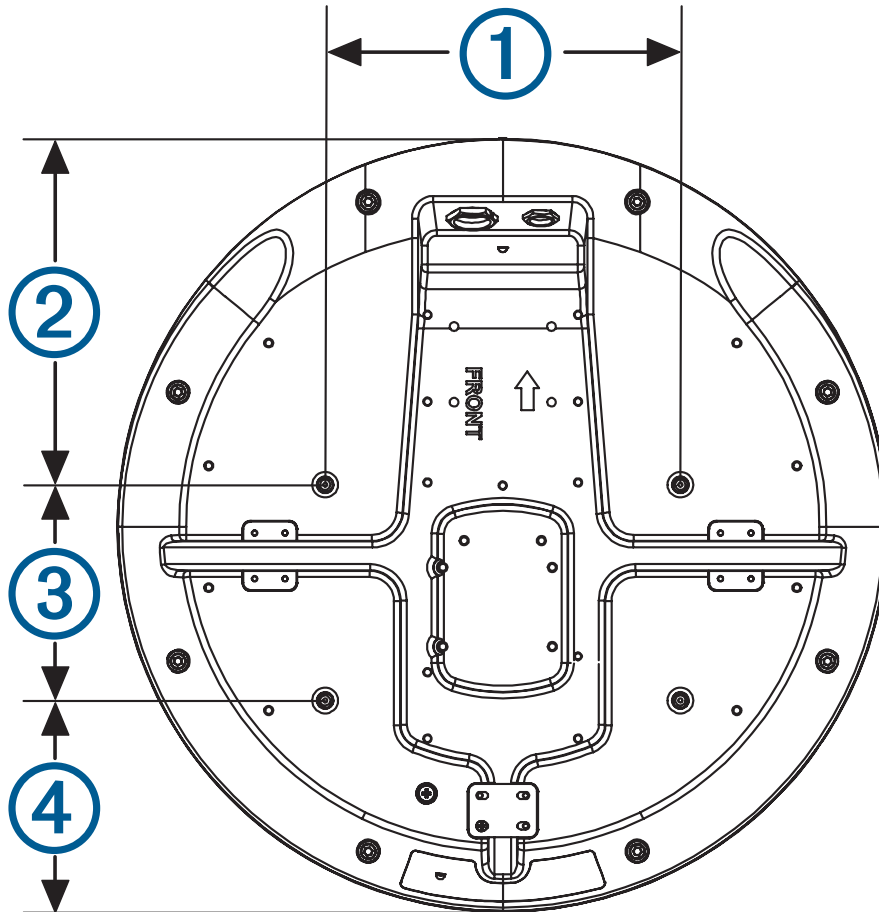
These minimum safe distances apply for a transmitting radar with a rotating internal antenna, and are much larger when the antenna is not rotating. If rotation of the antenna is obstructed for any reason, the transmitter will automatically turn off.

² Power consumption when transmitting is affected by the range setting. A greater range setting uses more power.

Detailed Dimensions



Item	GMR Phantom 18x	GMR Phantom 24x
Length	508.2 mm (20 in.)	645.4 mm (25 ⁷ / ₁₆ in.)
① (width)	504.7 mm (19 ⁷ / ₈ in.)	642.5 mm (25 ⁵ / ₁₆ in.)
② (height)	248.3 mm (9 ³ / ₄ in.)	250.3 mm (9 ⁷ / ₈ in.)



Item	GMR Fantom 18x	GMR Fantom 24x
①	233 mm (9 ³ / ₁₆ in.)	233 mm (9 ³ / ₁₆ in.)
②	227.5 mm (8 ¹⁵ / ₁₆ in.)	296.2 mm (11 ¹¹ / ₁₆ in.)
③	141.5 mm (5 ⁹ / ₁₆ in.)	141.5 mm (5 ⁹ / ₁₆ in.)
④	139.2 mm (5 ¹ / ₂ in.)	207.7 mm (8 ³ / ₁₆ in.)

Open-Source Software License

To view the open-source software license(s) used in this product, go to developer.garmin.com/open-source/linux/.

物質宣言

部件名称	有毒有害物质或元素									
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚	邻苯二甲酸二(2-乙基己)酯	邻苯二甲酸丁苄酯	邻苯二甲酸二丁酯	邻苯二甲酸二异丁酯
印刷电路板组件	×	○	○	○	○	○	○	○	○	○
金属零件	×	○	○	○	○	○	○	○	○	○
电缆 电缆组件 连接器	×	○	○	○	○	○	○	○	○	○
塑料和橡胶零件	○	○	○	○	○	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。

○: 代表此种部件的所有均质材料中所含的该种有害物质均低于 (GB/T26572) 规定的限量

×: 代表此种部件所用的均质材料中, 至少有一类材料其所含的有害物质高于 (GB/T26572) 规定的限量

* 该产品说明书应提供在环保使用期限和特殊标记的部分详细讲解产品的担保使用条件。



产品

連絡地址

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聯絡地址:新北市汐止區樟樹二路 68 號

電話:(02)2642-8999

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