GARMIN®

GSD™ 28 SONAR MODULE
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 follow these warnings, cautions, and notices could result in personal injury, damage to the vessel or device, or poor product performance.

You are responsible for the safe and prudent operation of your vessel. Sonar is a tool that enhances your awareness of the water beneath your boat. It does not relieve you of the responsibility of observing the water around your boat as you navigate.

⚠ CAUTION

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

To avoid possible personal injury or damage to the device and vessel, disconnect the vessel's power supply before beginning to install the device.

To avoid possible personal injury or damage to the device or vessel, before applying power to the device, make sure that it has been properly grounded, following the instructions in the guide.

To avoid possible personal injury or damage to this device and vessel, only install this device when the vessel is on land, or when properly secured and docked in calm water conditions.

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.

NOTICE

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

Read all installation instructions before proceeding with the installation. If you experience difficulty during the installation, contact Garmin Support.

Transducers

A transducer is required to send and receive a sonar signal from the sonar module. Proper transducer selection and installation are critical to the operation of the device. Because mounting locations vary, see your local Garmin dealer or contact Garmin Support for more information. Go to garmin.com/transducers to select a transducer.

Installation Preparation

Because every boat is different, you must carefully plan the GSD 28 sonar module installation.

1 Select a mounting location.
2 Mount the sonar module.
3 Connect the sonar module to the transducer.
4 Connect the sonar module to power.
5 Connect the sonar module to the network.

Tools Needed

- Drill
- 5mm ($^{13}/_{64}$ in.) drill bit for the mounting surface
- #2 Phillips screwdriver
- 3 mm flat screwdriver
- Dielectric grease
- Wire cutter
- Wire stripper
- 1 in. (24 mm) wrench
- Cable ties (optional)
- Cable grommets (optional)
- Marine sealant (optional)

Replacing a GSD 26 Sonar Module

If you are upgrading from a GSD 26 sonar module, observe these considerations.

- The GSD 28 device is horizontally smaller than the GSD 26 device. If possible, you should reuse two of the mounting holes on the right or left side of the mounting surface and drill two new holes for the opposite side. Both models use the same size mounting screws.
- If your network includes a Garmin BlueNet chartplotter, we recommend connecting the GSD 28 sonar module to your Garmin BlueNet chartplotter using a Garmin BlueNet cable, to ensure access to any future GSD 28 device software updates that may require Garmin BlueNet connectivity.
- You can use the included female-to-female Garmin BlueNet to Garmin Marine Network adapter to connect the Garmin Marine Network cable from your previous GSD 26 installation to the GSD 28 device, without having to route a new Garmin BlueNet cable to your chartplotter or port expander. We recommend this connection method only for vessels without a Garmin BlueNet chartplotter.

Mounting the Sonar Module

Mounting Location Considerations

- You must mount the sonar module in a location where it cannot be submerged.
- You must mount the sonar module in a location with adequate ventilation where it will not be exposed to extreme temperatures.
- You should mount the sonar module so that the LEDs are visible and the power and network cables can be easily connected.
- You should mount the sonar module in a location within reach of your transducer cable. If required, transducer extension cables are available through your Garmin dealer.

Mounting the Device

> **NOTICE**
>
> If you are mounting the device in fiberglass, when drilling the pilot holes, use a countersink bit to drill a clearance counterbore through only the top gel-coat layer. This will help to avoid cracking in the gel-coat layer when the screws are tightened.

NOTE: Screws are included with the device, but they may not be suitable for the mounting surface.

Before you mount the device, you must select a mounting location and determine what screws or other mounting hardware are needed for the surface.

1 Trim the template and make sure it fits in the location where you want to mount the device.
2 Secure the template to the selected location.
3 Mark pilot holes for the four corner of the device, and remove the template.
4 Using a 5mm ($^{13}/_{64}$ in.) drill bit, drill one of the pilot holes and lightly secure the device using one of the screws or selected mounting hardware.
5 Verify the positions of the other pilot hole marks and adjust them as necessary.
6 Drill the remaining pilot holes.
7 Secure the device to the mounting location using the remaining screws or selected mounting hardware.

Sonar Module Connections

> **NOTICE**
>
> Do not force a cable into its port. Forcing the cable can damage the pins. If the cable is properly aligned, the cable should connect easily.

Before you connect the sonar module to the transducer, network, and power, you must mount the sonar module (*Mounting the Sonar Module*, page 2).

Cable Routing Grommets

When routing cables through your boat, it may be necessary to drill holes to route the cables. Cable routing grommets can be used to cover cable installation holes. The grommets do not create a waterproof seal. If necessary, apply a marine sealant after installation to weatherproof around the grommet and the cable. You can purchase grommets from your Garmin dealer or directly from Garmin at garmin.com.

Connecting the Device to a Transducer

> **⚠ WARNING**
>
> To avoid the risk of serious injury, make sure the device is not connected to power before removing the terminal block lid.

> **NOTICE**
>
> The cord grips on the GSD 28 come with plugs installed. To ensure water cannot enter the transducer wiring block area and damage the device, do not remove the plug from an unused cord grip, and tighten all locking rings.
>
> The terminal blocks are not removable.

Preparing the Cables to Connect to the Sonar Module

Before you can begin the installation, you must check your transducer compatibility.

NOTE: The device does not support water speed wheels.

1 Remove the terminal block lid from the sonar module, using a #2 Phillips screwdriver.

2 Loosen one of the cord grips, and remove the rubber plug.

   If necessary, push the plug all the way through, and retrieve it from inside the terminal block area.

   NOTE: When connecting two single-element transducers, you should use the transducer cord grip on the left for a low-frequency transducer and the transducer cord grip on the right for a high-frequency transducer.

3 Feed the transducer cable through the cord grip, and pull the cable into the terminal block area.

   NOTE: If your transducer has a connector, cut the cable as close to the connector as possible, before feeding it through the cord grip. Then, use a wire stripper to remove about 90 mm (3 $^1/_2$ in.) of the outer cable jacket and foil shield, and 6 mm ($^1/_4$ in.) of the insulation from each internal wire. Tinning the stripped wires is recommended.

Connecting the Wires to the Terminal Block

Before you connect the wires, consult the wiring diagrams (*Transducer Wiring Diagrams*, page 7) to select the proper wiring configuration for your transducer and the wiring tables (*Transducer Wire Color Tables*, page 9) for specific examples of Garmin wire colors.

1 Connect the uninsulated section of each wire to the terminal block using a $^1/_8$ in (3 mm) flat screwdriver.

   NOTE: When connecting two single-element transducers, you must connect the second transducer to the duplicate set of connections on the opposite side of the terminal block.

   TIP: The primary transducer cable wire housing covers the wiring bundles. To identify the wiring groups in the bundles more easily, you can remove up to an inch of the cable housing.

2 If the transducer has a separate outer shield bare wire, connect it to one of the two ground posts under the terminal block using a #2 Phillips screwdriver.

Connecting a Transducer for Manual Configuration

While most transducer models are detected and configured automatically, in some cases you may need to configure a transducer manually.

1 Connect the temperature wire to the TEMP terminal, or install a jumper wire between the TEMP terminal and the GRND terminal.

2 For dual-element transducers, install another jumper wire between the TEMP terminal and the GRND terminal on the opposite end of the terminal block.

3 Connect the remaining transducer wires according to the wire color table (*Transducer Wire Color Tables*, page 9).

4 After the sonar module is powered on and connected to the network, configure the transducer using a connected chartplotter (*Manually Configuring a Transducer*, page 7).
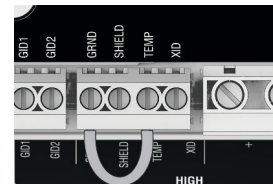
Securing the Wire Connections

1 When the wire connections are secure, use a 1 in. (24 mm) wrench to tighten the cord grip nut around the transducer cable.

   When tightened correctly, you should not be able to pull the transducer cable out of the housing.

2 Tighten any unused cord grip to form a seal around the rubber plug.

3 Reinstall the terminal block lid.

   NOTE: The sonar module does not operate when the lid is removed.

Connecting the Device to Power

> ⚠ **WARNING**
>
> When connecting the power cable, do not remove the in-line fuse holder. To prevent the possibility of personal 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 cables using the appropriate tie wraps, fasteners, and sealant to secure the cables along the route and through any bulkheads or to the deck.

   NOTE: If necessary, the power cable can be extended (*Power Cable Extensions*, page 5).

2 Connect the bare-wire end of the power cable to your power source and to ground.

   NOTE: If you have both a 12 Vdc and a 24 Vdc system on the vessel, you should connect the device to the 24 Vdc system for the best performance.

3 Apply dielectric grease to the connector on the power cable.

4 Align the notch on the end of the power cable with the POWER port on the device, and press the cable into place.

5 Tighten the locking ring.

Power Cable Extensions

If necessary, you can extend the power cable using the appropriate wire gauge for the type of power source and the length of the extension. Use marine-grade connectors or solder and water-resistant heat-shrink tubing when extending the power wires.
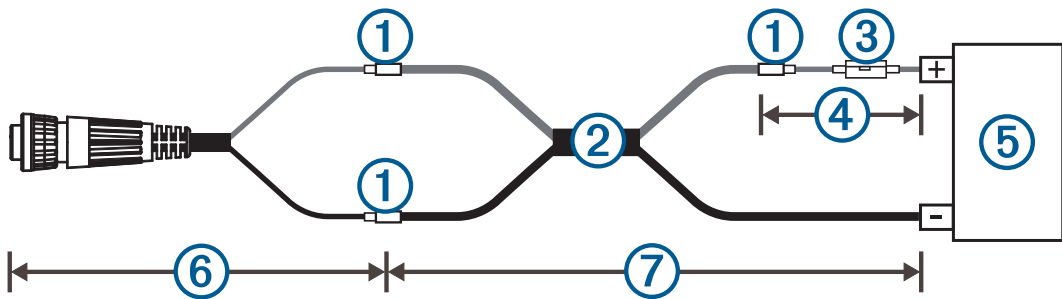
①	Splice
②	Extension wires, based on the type of power source and the length of the extension (*Power Cable Extension Wire Gauge Table*, page 6)
③	Fuse
④	20.3 cm (8 in.)
⑤	Power source
⑥	20.3 cm (8 in.)
⑦	11 m (36 ft.) maximum extension

Power Cable Extension Wire Gauge Table

To find the wire gauge you should use, cross-reference the length of the extension with the voltage of your power supply.

	24 Vdc	12 Vdc
Up to 4.6 m (15 ft.)	10 AWG (5.26 mm^2)	4 AWG (21.15 mm^2)
Up to 7 m (23 ft.)	8 AWG (8.37 mm^2)	2 AWG (33.63 mm^2)
Up to 11 m (36 ft.)	6 AWG (13.30 mm^2)	0 (1/0) AWG (53.48 mm^2)

Grounding the Sonar Module

The ground post is located to the right of the power supply connector.

Connect the ground post to the boat water ground circuit.

NOTE: The boat battery ground is an acceptable alternative if your vessel does not have a designated water ground circuit.
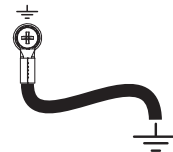
Networking Considerations

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 GSD 28 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 GSD 28 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 GSD 28 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 GSD 28 device and to your Garmin BlueNet chartplotter or Garmin BlueNet 20 switch.
2 Connect the Garmin BlueNet cable to the network port on the GSD 28 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 GSD 28 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 GSD 28 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.

Manually Configuring a Transducer

Before you can manually configure a transducer, you must connect it to the sonar module using a wiring method that allows for manual configuration (*Connecting a Transducer for Manual Configuration*, page 4).

1 On a chartplotter connected to the same network as the sonar module, from a sonar view, select **Options** > **Sonar Setup** > **Installation** > **Transducers**.

2 Select the GSD 28 sonar module.

3 Select **Manual Configuration**.

4 If more than one transducer is connected to the sonar module, select an option:
   • To configure the transducer connected to the terminals labelled LOW, select **Low**.
   • To configure the transducer connected to the terminals labelled HIGH, select **High**.

5 Select **Manual Enabled** to turn on manual configuration.

6 Set the parameters for your transducer.

7 Select **Done**.

Manual Transducer Configuration Parameters

NOTICE

If parameters are set incorrectly, manual transducer configuration may damage your transducer. If necessary, you should contact your transducer's manufacturer to verify the correct configuration parameters.

Impedance: The transducer's minimum impedance, in ohms.

Max. Transmit Power: The transducer's maximum transmit power, in watts.

Nominal Freq.: The transducer's nominal frequency, in kHz. If your transducer doesn't have a nominal frequency, set it to any frequency within its range. This will automatically set a frequency preset for this transducer.

CHIRP: Turn on if configuring a CHIRP transducer.

Lower 3dB Freq.: The lower frequency limit of CHIRP sweeps, in kHz.

**Upper 3dB Freq.**: The upper frequency limit of CHIRP sweeps, in kHz.

Transducer Wiring Diagrams

You can use these diagrams to identify the connection points for your transducer wires on the GSD 28 terminal block. Locate your transducer model in the wire color tables (*Transducer Wire Color Tables*, page 9) for more information.

NOTE: For better visibility, the wiring block label is duplicated in the diagrams below. The GSD 28 device has one terminal block label, placed in front of the terminal block.

Single-Element Transducers

You can connect a single-element transducer to the terminals labelled LOW or HIGH, regardless of nominal frequency. To ensure proper transducer identification and safe operation, you must connect each single-element transducer to its own set of terminals.
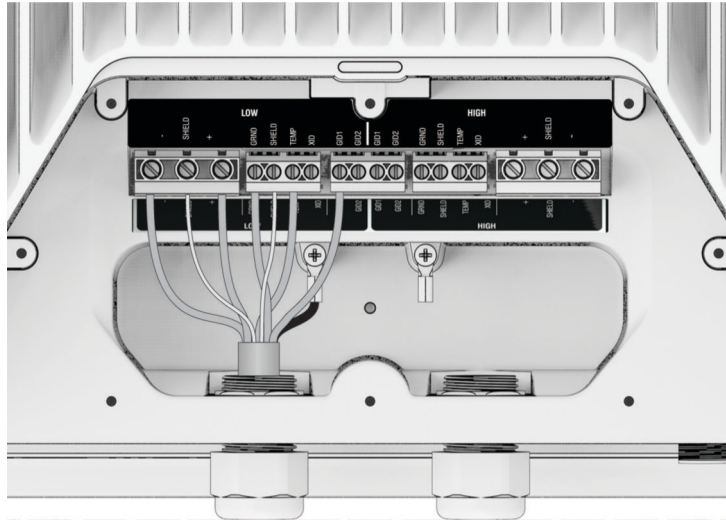
Dual-Element Transducers

NOTICE

Connecting the high-frequency wires to the low-frequency terminal block, or the low-frequency wires to the high-frequency terminal block, damages the device and the transducer.

For dual-element transducers, the low-frequency element wires must be connected to the terminals labelled LOW and the high-frequency element wires must be connected to the terminals labelled HIGH. Ground (GRND), temperature (TEMP), XID and GID wires can be connected to either set of terminals.
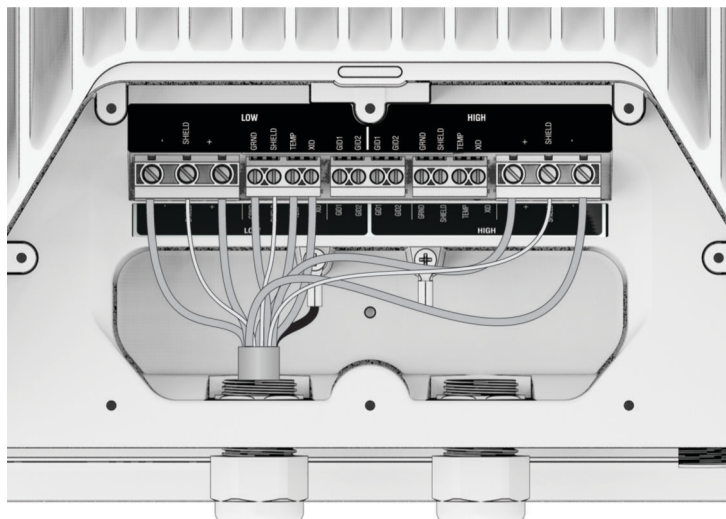
Two Single-Element Transducers

To ensure proper transducer identification and safe operation, you must connect each single-element transducer to its own set of terminals.

Transducer Wire Color Tables

Single-Element Transducers

You can connect a single-element transducer to the terminals labelled LOW or HIGH, regardless of nominal frequency. To ensure proper transducer identification and safe operation, you must connect each single-element transducer to its own set of terminals.

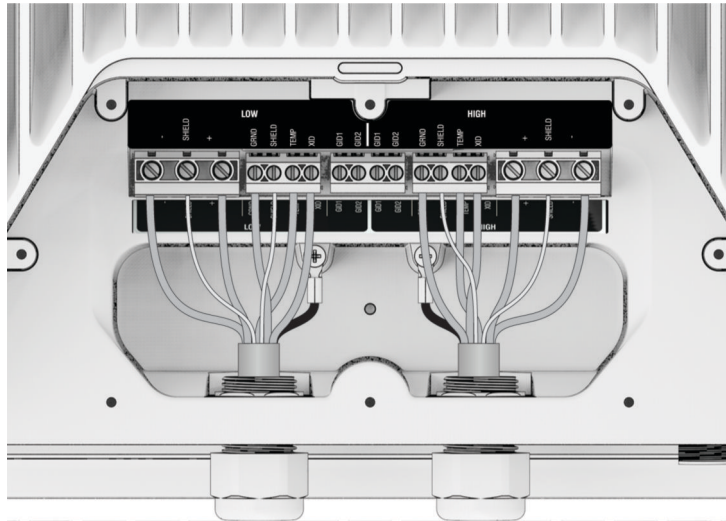| Transducer Model	+	SHIELD	–	GRND	SHIELD	TEMP	XID	GID1	GID2	Ground Post
Garmin GT12M-THF	Red	N/A	Black	Bare	N/A	White	N/A	Yellow	N/A	N/A
Garmin GT15M-THF	Red	N/A	Black	Bare	N/A	White	N/A	Yellow	N/A	N/A
Garmin GT17M-THF	Red	N/A	Black	Bare	N/A	White	Orange	Yellow	N/A	N/A
Airmar TM185M	Blue	Bare	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B175L	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B175M	Blue	Bare	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B175H	Blue	Bare	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar TM150M	Blue	N/A	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B150M	Blue	N/A	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B75L	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B75M	Blue	Bare	Black	Brown	N/A	White	Orange	N/A	N/A	Bare
Airmar B75H	Blue	Bare	Black	Brown	N/A	White	Orange	N/A	N/A	Bare

Dual-Element Transducers

Dual-element transducer wires must be connected to the specified terminals.

Transducer Model	LOW +	LOW SHIELD	LOW –	GRND	SHIELD	TEMP	XID	GID1	GID2	HIGH +	HIGH SHIELD	HIGH –	Ground Post
Airmar 509LHW	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R509LH	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R509LM	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar CM599LHW	Blue/White	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar CM599LH	Blue/White	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar CM599LM	Blue/White	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R599LH	Blue/White[1]	Bare	Black/White	Brown	Bare	N/A	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R599LM	Blue/White[1]	Bare	Black/White	Brown	Bare	N/A	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R109LHW	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R109LM	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R109LH	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar R111LH	Blue/White[1]	Bare	Black/White	Brown	Bare	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar M265LH	Blue/White[1]	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar B265LM	Blue/White[1]	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar B265LH	Blue/White[1]	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar TM265LM	Blue/White[1]	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar TM265LH	Blue/White[1]	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar PM265LM	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare

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[1] Yellow before 11/20/10

Transducer Model	LOW +	LOW SHIELD	LOW –	GRND	SHIELD	TEMP	XID	GID1	GID2	HIGH +	HIGH SHIELD	HIGH –	Ground Post
Airmar PM265LH	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar B275LHW	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare
Airmar PM411LWM	Blue/White	Bare	Black/White	Brown	N/A	White	Orange	N/A	N/A	Blue	Bare	Black	Bare

Status LED

After the sonar module is installed, it turns on when the chartplotter is turned on. The status LED on the sonar module indicates its operational status.

LED Color	State	Status
Red	Solid	The sonar module is booting.
Green	Flashing	The sonar module is connected to a chartplotter and is operating properly.
Red	Flashing	The sonar module is turned on, but is not connected to a chartplotter, or is waiting to connect to a chartplotter.
Orange	Flashing	A software update is in progress.
Red/Green	Flashing	The sonar module is in test mode.
Red/Orange	Flashing	The sonar module terminal block lid is open.
Red	Flashes twice followed by a 3-second pause	Other sonar failure. Check all connections.
Red	Flashes three times followed by a 3-second pause	The transducer is not detected by the sonar module.
Red	Flashes four times followed by a 3-second pause	The sonar module input voltage is below the minimum required input voltage.
Red	Flashes five times followed by a 3-second pause	The sonar module input voltage is above the maximum allowed input voltage.

Specifications

Size	L x W x H: 270.65 x 366.55 x 101 mm (10.66 x 14.43 x 3.98 in.)
Weight	6.41 kg (14.125 lb.)
Case material	Fully gasketed, aluminum and steel housing with plastic access panel .
Water rating	IEC 60529 IPX7[2]
Temperature range	From 5 to 158°F (from -15 to 70°C)
Power input	From 10 to 32 Vdc
Power usage	120 W max.
Fuse	15 A (fast-acting, blade type)
Compass safe distance	190 cm (75 in.)
Sounder power	From 25 to 3,000 W (RMS)[3]
Frequency	From 25 to 250 kHz (dependent on transducer)
Depth	3,048 m (10,000 ft.)[4]
Data output	Garmin BlueNet network

連絡地址

製造銷售:台灣國際航電股份有限公司
聯絡地址:新北市汐止區樟樹二路 68 號
電　　話:(02)2642-8999
客服專線:(02)2642-9199

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[2] The device withstands incidental exposure to water of up to 1 m for up to 30 min. For more information, go to www.garmin.com/waterrating.
[3] Dependent on transducer rating and depth.
[4] Maximum depth dependent on transducer, water salinity, bottom type, and other water conditions.

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。

(10) 产品