

GARMIN®

MSC 10 MARINE SATELLITE COMPASS INSTALLATION INSTRUCTIONS

Important Safety Information

⚠ CAUTION

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.

For the best performance and to avoid damage to your boat, read all installation instructions before proceeding. Install the device according to these instructions. Use the appropriate fasteners, tools, and mounts listed, which are available at most marine dealers.

The MSC 10 satellite compass provides heading information to your existing NMEA 2000® network. If your boat does not have a NMEA 2000 network, you must install one. For more information, go to garmin.com/manuals/nmea_2000.

Tools Needed

- Drill
- 19 mm ($3/4$ in.) drill bit for a pole-mount cable-hole
- 5 mm ($3/16$ in.) drill bit for surface-mount screw holes
- 25 mm (1 in.) hole saw for a surface-mount cable-hole
- #2 Phillips screwdriver
- 35 mm ($1\ 3/8$ in.) wrench
- Marine sealant
- Torque wrench
- 7 mm ($9/32$) socket for torque wrench
- Additional NMEA 2000 network components as needed

Compass Mounting Considerations

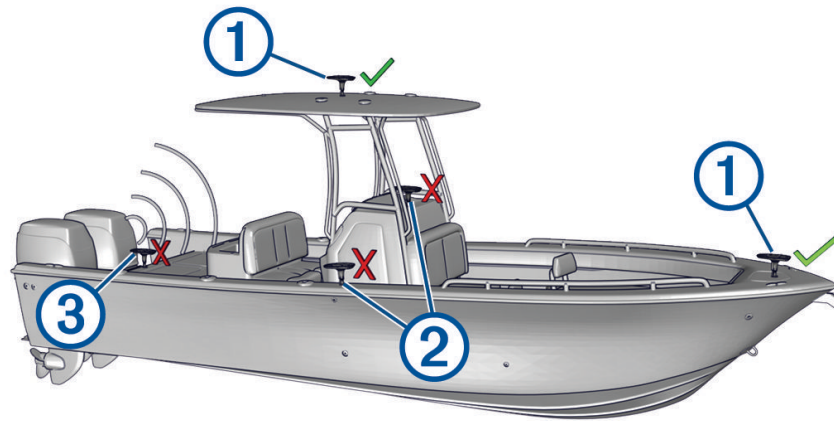
This compass requires a clear, unobstructed view of the sky and horizon in all directions, and installing it near any structure on the boat will negatively affect performance. You should test the selected location before permanently installing the compass.

NOTE: The compass may lose heading information when operating below a bridge, under a slip, or near tall structures. To retain heading information in these situations, the MSC 10 can be configured to use an internal magnetic compass as a backup to the GPS compass (recommended). To enable this backup, you can calibrate the device (*Heading Calibration, page 7*) prior to use.

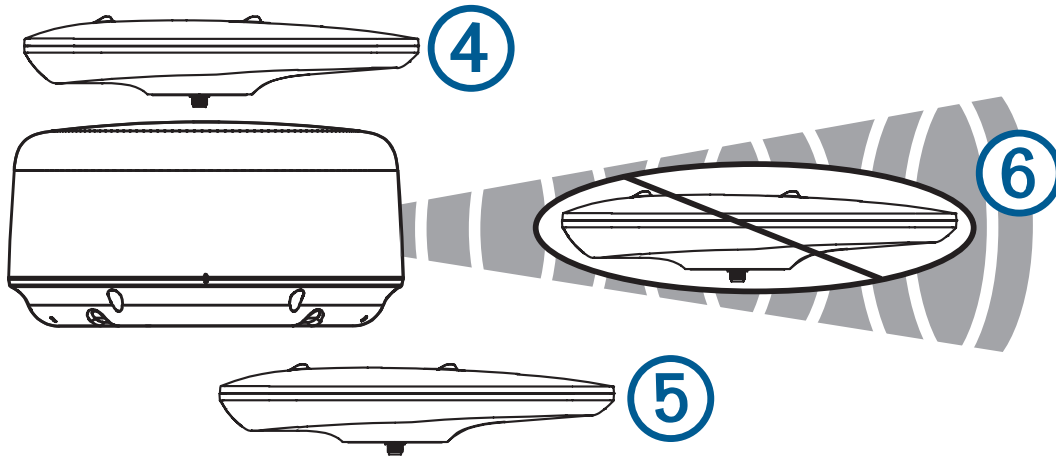
You can mount the compass on a flat surface or attach it to a standard stainless steel, 1 in. OD, 14 threads per inch, pipe-threaded pole (not included). You can route the cable outside of the pole or through the pole. For best performance, consider these guidelines when selecting the mounting location:



- The compass must be mounted in a location that has a clear, unobstructed view of the sky in all directions
 ①. Select a location that has no objects higher than five degrees above the device.

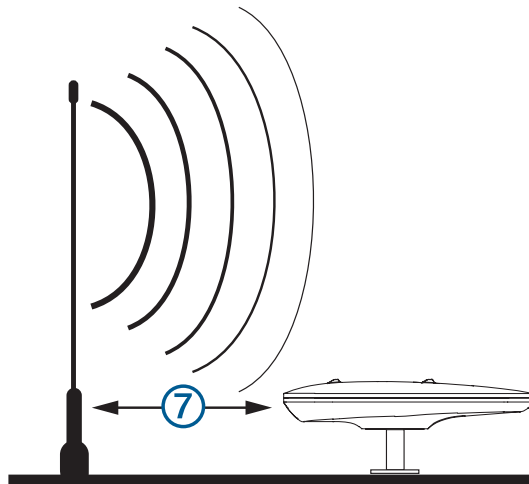


- The compass must not be mounted where it is shaded by the superstructure of the boat ②, a radome antenna, or the mast.
- The compass must not be mounted inside or adjacent to the cabins.
- The compass should not be mounted near the engine or other sources of Electromagnetic Interference (EMI) ③.
- If a radar is present, the compass should be mounted above the path of the radar ④. If necessary, the compass may be mounted below the path of the radar ⑤.



- The compass should not be mounted directly in the path of the radar ⑥.

- The compass should not be mounted within 1 m (3 ft.) of a VHF radio antenna ⑦.



If you plan to use the internal magnetic compass as a backup (recommended), consider these guidelines when selecting the mounting location:

- The compass should not be mounted near known ferrous metal objects such as a toolbox or another compass.
- A handheld compass should be used to test for magnetic interference in the area where the compass is to be mounted. Your boat, motors, and devices must be turned on during the test.

If the needle on the handheld compass moves when you hold it where you intend to mount the compass, magnetic interference is present. You must choose another location and test again.

- Mounting screws are provided with the compass. If you use mounting hardware other than the provided screws, the hardware must be made of quality stainless steel or brass material to avoid magnetic interference with the compass.

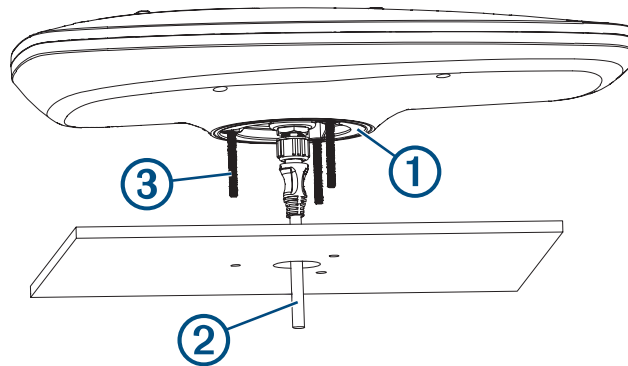
NOTE: Test all mounting hardware with a handheld compass to make sure no magnetic fields are present in the hardware.

Surface Mounting the Compass

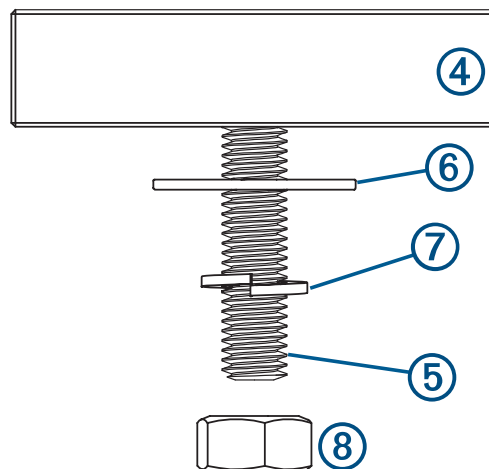
Before you mount the compass, you must review the mounting location considerations and select a mounting location.

NOTE: The supplied M4 x .07 x 45 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.), you must use longer threaded rods (not included).

- 1 Secure the included mounting template to the selected mounting location.
- 2 Drill the three 5 mm ($\frac{3}{16}$ in.) screw holes.
- 3 Drill the 25 mm (1 in.) cable hole in the center.
- 4 Install the included gasket ① on the bottom of the compass.



- 5 Route the cable ② through the center hole, and connect it to the compass.
- 6 Insert the three threaded rods ③ into the mounting holes on the bottom of the compass. Up to 35 mm ($1\frac{3}{8}$ in.) of the threaded rods may extend below the compass.
- 7 Place the compass ④ on the surface, feeding the threaded rods through the holes you drilled previously.
- 8 Apply a bead of marine sealant on the mounting surface around each mounting hole.
- 9 Fasten the compass ④ to the mounting surface using the threaded rods ⑤, flat washers ⑥, spring washers ⑦, and hex nuts ⑧.



- 10 Using a torque wrench, tighten the nuts to 13.7 to 18.6 N-m (10 to 14 lbf-ft.).
- 11 Route the cable away from sources of electronic interference.

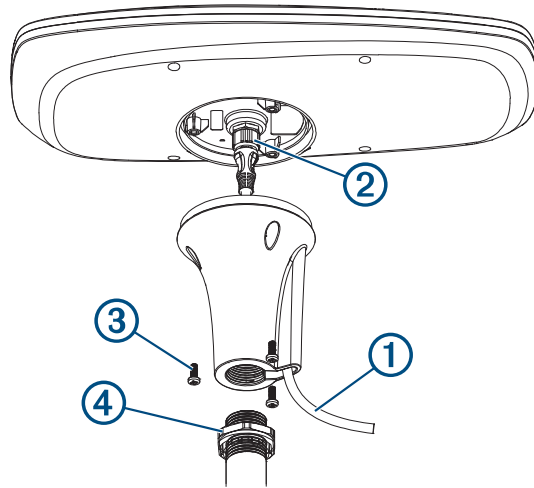
Mounting the Compass on a Pole

Using the included pole-mount adapter, this device can be installed on a standard 1 in. OD, 14 threads per inch, pipe-threaded stainless steel pole (not included). The cable can be routed inside or outside of the pole.

NOTE: This device is designed for use with a stainless steel pole. Mounting the device on a plastic pole can result in unintentional rotation that may affect the heading information.

Mounting the Compass with the Cable Routed Outside the Pole

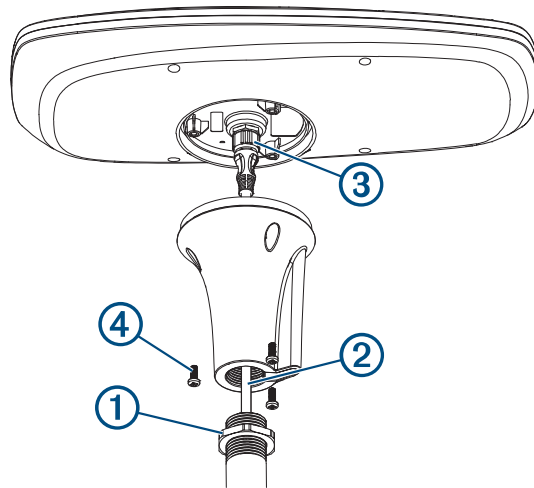
- 1 If necessary, position the stainless steel pole in the selected location.
- 2 Route the cable ① through the pole-mount adapter, and place the cable in the vertical slot along the base of the pole-mount adapter.



- 3 Connect the cable to the compass ②.
- 4 Place the compass on the pole-mount adapter and fasten the included M4 screws ③ to secure it.
- 5 Screw the included metal nut ④ onto the threaded pole as close to the base as possible.
- 6 Screw the pole-mount adapter onto the pole, but do not fully tighten it.
- 7 Apply the included adhesive around the threads of the pole.
- 8 Align the compass so it is pointed toward the bow of the boat.
NOTE: You can use the sights on top of the compass to help align it.
- 9 While keeping the compass steady, finger tighten the nut.
- 10 Using a 35 mm (1 ³/₈ in.) wrench, turn the jam nut ¹/₄ turn to secure it.
- 11 After the compass is secured on the pole mount, fill the remaining gap in the vertical cable slot with a marine sealant (optional).
- 12 Wipe off any excess adhesive or marine sealant.
- 13 Route the cable away from sources of electronic interference.

Mounting the Compass with the Cable Routed Through the Pole

- 1 If necessary, attach the stainless steel pole to the boat:
 - 1.1 Position the pole in the selected location, and mark the approximate center of the pole.
 - 1.2 Drill a hole using a 19 mm ($3/4$ in.) drill bit for the cable to pass through.
 - 1.3 Fasten the pole to the boat.
- 2 Screw the included metal nut ① onto the threaded pole as close to the base as possible.



- 3 Route the cable ② through the pole, through the pole-mount adapter, and connect it to the compass ③.
- 4 Place the compass on the pole-mount adapter, and fasten the included M4 screws ④ to secure it.
- 5 Screw the pole-mount adapter onto the pole, but do not fully tighten it.
- 6 Apply the included adhesive around the threads of the pole.
- 7 Align the compass so it is pointed in the same direction as the boat.
NOTE: You can use the sights on the top of the compass to help align it.
- 8 While holding the compass steady, finger tighten the nut.
- 9 Using a 35 mm ($1\frac{3}{8}$ in.) wrench, turn the nut $1/4$ turn to secure it.
- 10 After the compass is secured on the pole mount, fill the vertical cable slot with a marine sealant (optional).
- 11 Wipe off any excess adhesive or marine sealant.
- 12 Route the cable away from sources of electronic interference.

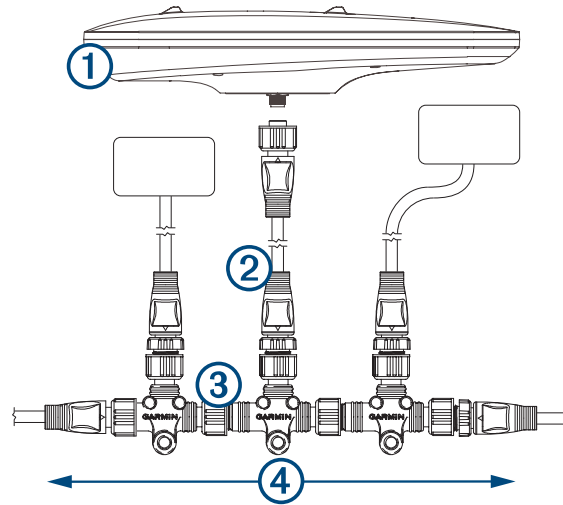
Connecting the Compass

NMEA 2000 Network Connection

If you do not have an existing NMEA 2000 network, you must install a NMEA 2000 network on your boat. For more information on NMEA 2000, go to garmin.com/manuals/nmea_2000.

The compass is packaged with a NMEA 2000 T-connector and a NMEA 2000 drop cable. You will use these two components to connect the compass to your existing NMEA 2000 network.

A 6 m (20 ft.) drop cable is included. If more cable is needed, add an extension to your NMEA 2000 backbone, based on the NMEA 2000 guidelines. A shorter drop cable can be installed if desired.



①	MSC 10
②	NMEA 2000 drop cable
③	NMEA 2000 T-connector
④	NMEA 2000 backbone

Heading Calibration

This device uses GPS signals to calculate the heading, so calibration is not required.

This device also contains an internal magnetic compass that can be used as a backup to avoid a possible loss of heading information in areas where GPS signals are blocked or weak, such as under bridges, near tall structures, and in covered slips. Calibration of the backup magnetic compass is highly recommended. If you plan to use the backup magnetic compass, verify that the device is installed in a location free from magnetic interference (*Compass Mounting Considerations, page 1*) and perform the appropriate calibration process (optional).

There are two options you can use to calibrate the backup magnetic compass:

- If the device is connected to the same NMEA 2000 network as a Garmin® chartplotter, you should perform the menu-based calibration procedure (*Performing Menu-Based Calibration, page 8*).
- If there is not a Garmin chartplotter connected to the NMEA 2000 network, or if you are connected to a third-party display device, you must use the basic calibration procedure (*Performing Basic Calibration, page 8*).

Performing Menu-Based Calibration

- 1 Select **Settings** > **Communications** > **NMEA 2000 Setup** > **Device List**.
- 2 Select the MSC 10 from the device list.
- 3 Select **Review** > **Compass Cal.** > **Begin**.
- 4 Follow the on-screen instructions until the compass calibration is complete.
- 5 Select **Auto Heading Alignment** > **Begin**.
- 6 Follow the on-screen instructions until the heading alignment is complete.

Disabling the Magnetic Heading Data

If you cannot mount the device in an ideal location for magnetic heading and GPS performance, you can disable the magnetic heading data.

Perform a factory reset (*Compass Settings, page 10*).

After a factory reset, the device no longer outputs magnetic heading data, but it continues to output GPS Course over Ground and GNSS-based heading.

Adjusting the Fine Heading Alignment

You can adjust the Fine Heading Alignment in conjunction with Auto Heading Alignment to fine-tune the heading output (optional).

NOTE: Fine heading alignment must be completed under open skies to ensure proper calibration.

- 1 Select **Settings** > **Communications** > **NMEA 2000 Setup** > **Device List**.
- 2 Select the MSC 10 device.
- 3 Select **Review** > **Compass Cal.** > **Fine Heading Alignment**.
- 4 Using a landmark or a known good compass, determine the heading of your boat.
- 5 Adjust the heading until it matches your measurement.
- 6 Select **Done**.

Performing Basic Calibration

If you connect the compass to a NMEA 2000 network without a compatible Garmin chartplotter or with a third-party display device, you must perform basic calibration instead of menu-based calibration.

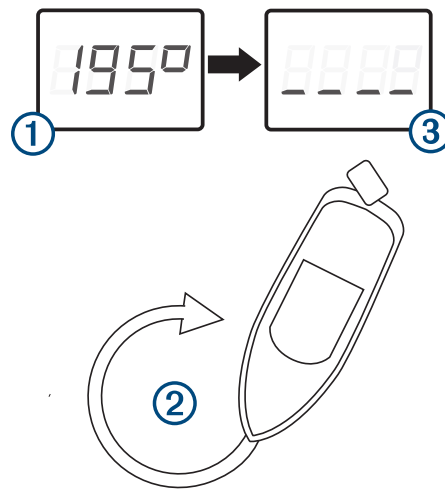
Before you can perform basic calibration, you must be able to view heading data from the NMEA 2000 network on a connected device. To perform basic calibration, you must remove from the network all sources of heading data other than the compass.

When performing basic calibration, you first calibrate the compass and then align the heading in one continuous procedure.

NOTE: The boat must be able to reach a cruising speed of at least 6.4 km/h (4 mph) to perform the heading alignment.

- 1 Drive the boat to a location with calm, open water.
- 2 Set the display to view heading data from the connected compass.
NOTE: You must not use GPS Course Over Ground (COG) to perform basic calibration.
- 3 Disconnect the compass from the NMEA 2000 network or turn off the power to the NMEA 2000 network.
- 4 Wait while the boat becomes level and stationary.

- 5 Turn on power to the compass, and wait until the heading data appears on the display ①.
NOTE: If you are performing the first basic calibration after a factory reset, the heading is blank.



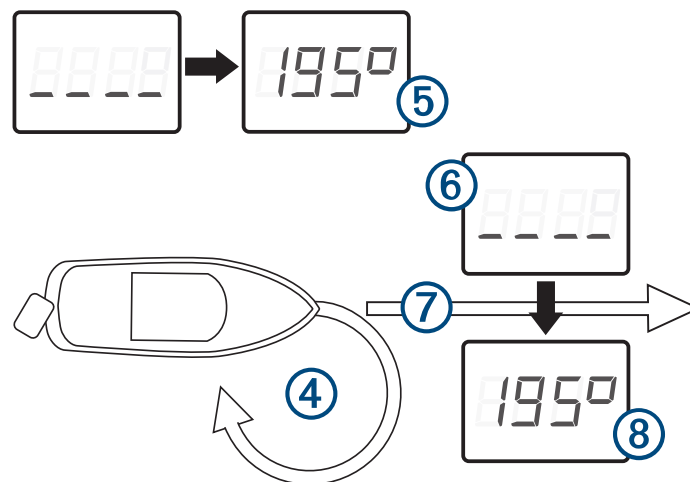
- 6 Within three minutes, complete two full, slow, tight circles ②, taking care to keep the boat as steady and level as possible.

The boat should not list during calibration.

When the compass is prepared to calibrate the compass, the heading data disappears from the display ③

You may receive an error message that the heading was lost. You can ignore this message.

- 7 Continue turning in the same direction at the same speed ④ for approximately 1 1/2 rotations until the heading data appears ⑤.



When the heading data appears, the compass has been calibrated successfully, and you can align the heading (optional).

- 8 Select an option.
- If you want to align the heading to match the front of the boat, proceed to the next step.
 - If you do not want to align the heading, stop turning and wait, keeping the boat stationary. Over the next two minutes the heading data should disappear and then reappear. When the heading data reappears, the compass should be calibrated and no heading offset should be applied.

NOTE: If an unwanted heading offset is applied, repeat the calibration procedure.

- 9 Continue turning in the same direction at the same speed for approximately ten seconds, until the heading data disappears from the display ⑥.

10 When it is safe, straighten the boat and drive in a straight line ⑦ at cruising speed (must be at least 6.4 km/h (4 mph)) until the heading data appears ⑧.

When the heading appears, the compass has been calibrated, and the heading has been aligned.

11 Test the results of the calibration, and repeat this procedure if necessary.

Compass Settings

From the NMEA 2000 device list, select the MSC 10, and select Review.

Auto Locate: Allows you to clear existing satellite data and force the device to acquire new data.

Factory Defaults: Allows you to reset the antenna settings to the factory default value. You will lose all custom configuration settings.

Cleaning the Outer Casing

NOTICE

Avoid chemical cleaners and solvents that can damage plastic components.

- 1 Clean the outer casing of the device using a cloth dampened with a mild detergent solution.
- 2 Wipe the device dry.

Appendix

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.

Specifications

Dimensions (length × width × height)	334 × 156 × 66 mm (13 ⁵ / ₃₂ × 6 ⁹ / ₆₄ × 2 ¹⁹ / ₃₂ in.)
Weight	810 g (28.6 oz.)
NMEA 2000 drop cable length	6 m (19 ft. 8 in.)
Operating temperature range	From -15° to 70°C (from 5° to 158°F)
Storage temperature range	From -40° to 85°C (from -40° to 185°F)
Case material	ASA (Acrylonitrile styrene acrylate)
Water rating	IPX7 ¹
Compass-safe distance	0 mm (0 in.)
Power input source	9 to 32 Vdc, unregulated
Max. input current	275 mA @ 9 Vdc
Typical input current	180 mA @ 12 Vdc
NMEA 2000 LEN @ 9 Vdc	6
Typical NMEA 2000 draw	2W
Max. NMEA 2000 draw	2.5W

¹ 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.

NMEA 2000 PGN Information

Transmit

059392	ISO acknowledgment
060928	ISO address claimed
126208	Request group function
126464	Transmit and receive PGN list group function
126992	System time
126996	Product information
127250	Vessel heading
127251	Rate of turn
127252	Heave
127257	Attitude data
127258	Magnetic variation
129025	Position: Rapid update
129026	COG and SOG: Rapid update
129029	GNSS position data
129539	GNSS DOPs
129540	GNSS satellites in view

Receive

059392	ISO acknowledgment
059904	ISO request
060928	ISO address claimed
126208	Request group function

Declaration of Conformity

Hereby, Garmin declares that this product is in compliance with the Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.garmin.com/compliance>.

UK Declaration of Conformity

Hereby, Garmin declares that this product is in compliance with the relevant statutory requirements. The full text of the declaration of conformity is available at the following internet address: <http://www.garmin.com/compliance>.

Innovation, Science and Economic Development Canada Compliance

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications if not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

Limited Warranty

The Garmin standard limited warranty applies to this accessory. For more information, go to www.garmin.com/support/warranty.

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
印刷电路板组件	X	0	0	0	0	0
金属零件	X	0	0	0	0	0
电缆 电缆组件 连接器	X	0	0	0	0	0

本表格依据 SJ/T11364 的规定编制。

0: 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

X: 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

*該產品說明書應提供在環保使用期限和特殊標記的部分詳細講解產品的擔保使用條件。



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