Raymarine®

HYPERVISION™
HV-300

Installation instructions

English (en-US)
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Software updates

Check the Raymarine website for the latest software releases for your product.
www.raymarine.com/software

Product documentation

The latest versions of all English and translated documents are available to download in PDF format from the website: www.raymarine.com/manuals.
Please check the website to ensure you have the latest documentation.

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Contents

Chapter 1: Important information

Warning: Product installation and operation

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- Raymarine recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.

Warning: Anti-fouling

- Failure to comply with the provided anti-fouling and transducer cleaning instructions may affect your product warranty.
- Only use water-based anti-fouling paint.
- Do NOT use keytone or copper-based anti-fouling paint.

Warning: Marine-grade sealant

Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

Warning: High voltages

This product may contain high voltages. Do NOT remove any covers or otherwise attempt to access internal components, unless specifically instructed in the documentation provided.

Warning: Switch off power supply

Ensure the vessel's power supply is switched OFF before starting to install this product. Do NOT connect or disconnect equipment with the power switched on, unless instructed in this document.

Warning: Transducer operation

Only test and operate the transducer in the water. Do NOT operate out of water as overheating may occur.

Caution: Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized Raymarine dealers. Unauthorized repair may affect your warranty.

Water ingress

Water ingress disclaimer

Although the waterproof rating capacity of this product meets the stated water ingress protection standard (refer to the product's *Technical Specification*), water intrusion and subsequent equipment failure may occur if the product is subjected to high-pressure washing. Raymarine will not warrant products subjected to high-pressure washing.

Disclaimer

Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

Raymarine is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

Declaration of Conformity

FLIR Belgium BVBA declares that the following products are in compliance with the EMC Directive 2014/30/EU:

- HV-300TH thru-hull plastic transducer, part number A80604
- HV-300THP-P thru-hull plastic transducer, part number R70725
- HV-300THP-S thru-hull plastic transducer, part number R70726

The original Declaration of Conformity certificate may be viewed on the relevant product page at www.raymarine.com/manuals.

Warranty registration

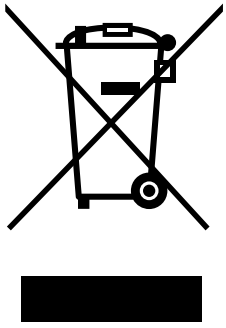
To register your Raymarine product ownership, please visit www.raymarine.com and register online.

It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment which contains materials, components and substances that may be hazardous and present a risk to human health and the environment when WEEE is not handled correctly.



Equipment marked with the crossed-out wheeled bin symbol indicates that the equipment should not be disposed of in unsorted household waste.
Local authorities in many regions have established collection schemes under which residents can dispose of waste electrical and electronic equipment at a recycling center or other collection point.
For more information about suitable collection points for waste electrical and electronic equipment in your region, refer to the Raymarine website: www.raymarine.eu/recycling.

IMO and SOLAS

The equipment described within this document is intended for use on leisure marine boats and workboats NOT covered by International Maritime Organization (IMO) and Safety of Life at Sea (SOLAS) Carriage Regulations.

Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and this document. Please check the Raymarine website (www.raymarine.com) to ensure you have the most up-to-date version(s) of the documentation for your product.

Chapter 2: Document and product information

Chapter contents

2.1 Product documentation

The following documentation is applicable to your product:

All documents are available to download as PDFs from www.raymarine.com/manuals

Documentation

Description	Part number
HV-300TH, HV-300THP-P, HV-300THP-S Thru-hull Plastic Transducer Installation Instructions (this document)	87391
HV-300TH, HV-300THP-P, HV-300THP-S Thru-hull Plastic Transducer Mounting Template	87365
Element™ **HyperVision**™ Basic Operation instructions. Includes basic operation instructions for the Sonar app on your display.	81384
Element™ **HyperVision**™ Advanced Operation instructions. Includes advanced operation instructions for the Sonar app on your display.	81388

Operation instructions

For detailed operation instructions for your product, refer to the documentation that accompanies your display.

All product documentation is available to download from the Raymarine website: www.raymarine.com/manuals.

Document illustrations

Your product and if applicable, its user interface may differ slightly from that shown in the illustrations in this document, depending on product variant and date of manufacture.

All images are provided for illustration purposes only.

2.2 Applicable products

Your installation should comprise either a single **HV-300TH** transducer, or a split-pair of **HV-300THP-P** and **HV-300THP-S** transducers.

The transducers are supplied with a fairing block that can be used to mount on vessel hulls with a dead rise from 0° up to 25°.

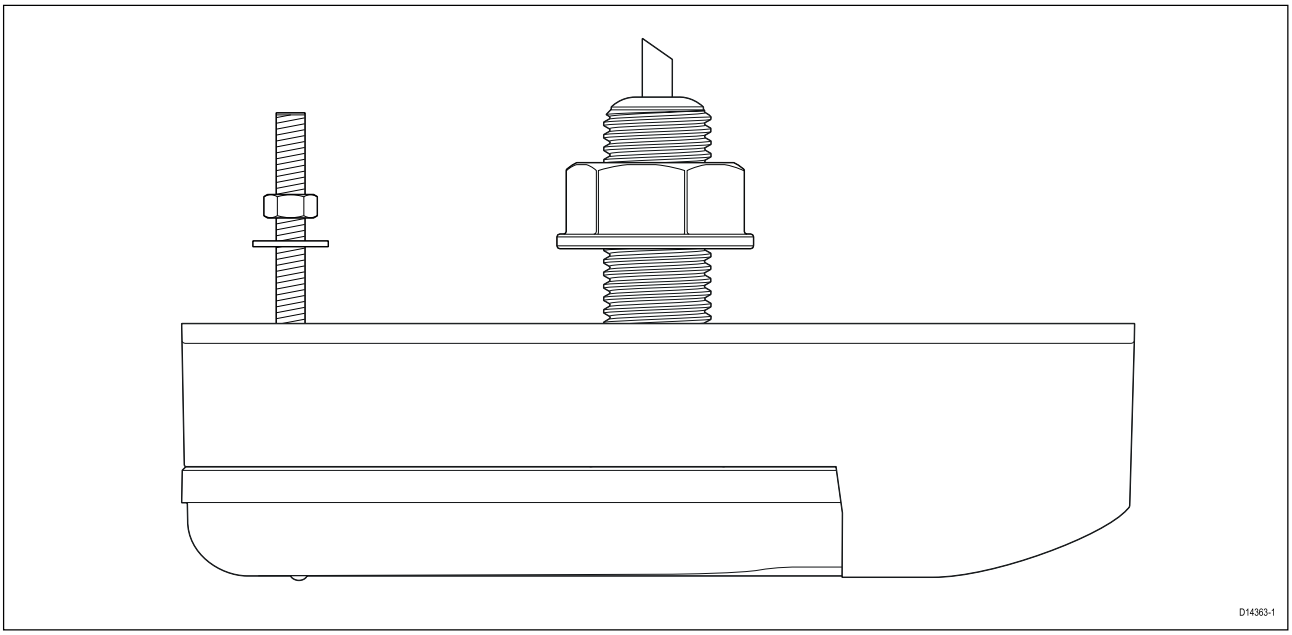
Part number	System pack	Description
A80604	N/A	**HV-300TH** HyperVision™ all-in-one thru-hull plastic transducer
R70725	T70448	**HV-300THP-P** HyperVision™ port side thru-hull split pair plastic transducers
R70726		**HV-300THP-S** HyperVision™ starboard side thru-hull split pair plastic transducers

2.3 Product overview

The HV-300TH series transducers are HyperVision™ thru-hull plastic transducers. Your installation must include either a single HV-300TH, or a split-pair of HV-300THP-P (Port) and HV-300THP-S (Starboard). The transducer is compatible with HyperVision™ variant displays.

Note:

Plastic thru-hull transducers are recommended for fiberglass and metal hulls and should not be used on vessels with wooden hulls.



The transducer has a 0° tilted element. The supplied fairing block should be cut to match the dead rise angle of your hull.

HyperVision™ transducers are capable of producing sonar images for:

- RealVision™ 3D (Hyper 1.2 MHz)
- RealVision™ 3D (Standard 350 kHz)
- SideVision™ (Hyper 1.2 MHz)
- SideVision™ (Standard 350 kHz)
- DownVision™ (Hyper 1.2 MHz)
- DownVision™ (Standard 350 kHz)
- Conical high CHIRP (200 kHz)

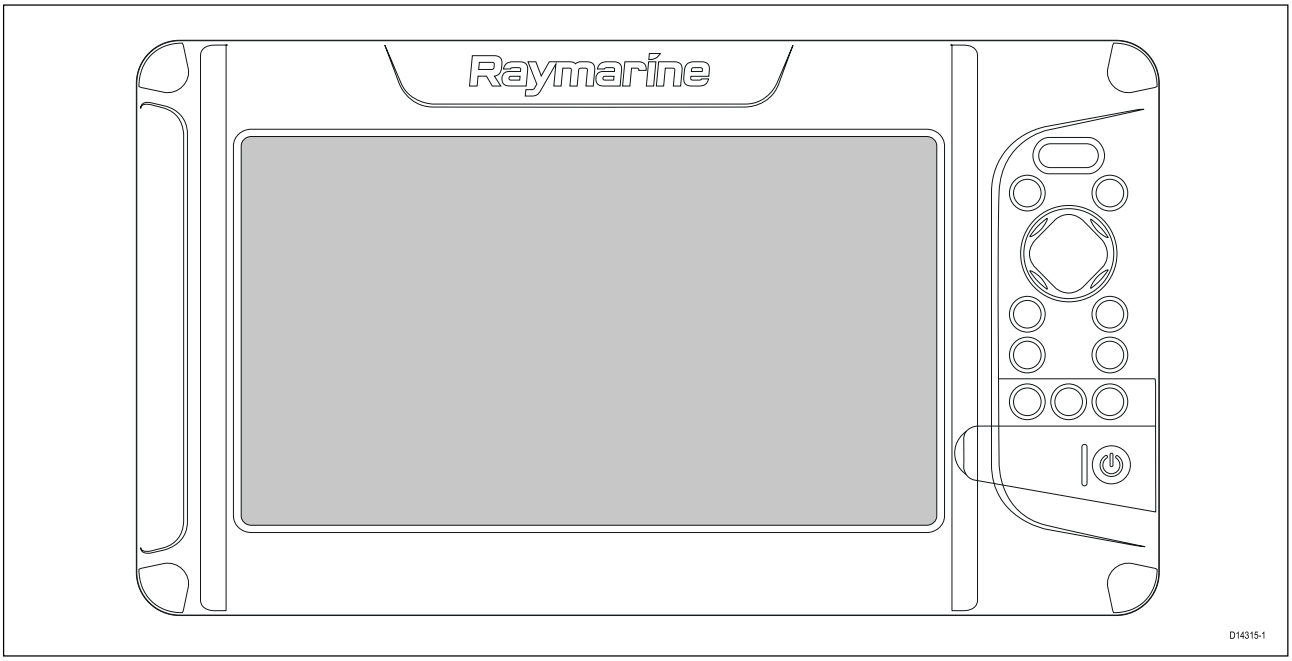
2.4 Required additional components

This product forms part of a system of electronics and requires the following additional components for full operation.

- Compatible HyperVision™ sonar-capable device. Refer to **p.13 — Compatible displays** , for a list of compatible products.
- For longer cable runs, a transducer extension cable will also be required. Refer to **p.39 — HV–300 transducer extension cable**, for suitable cables.

Compatible displays

Compatible displays are listed below.

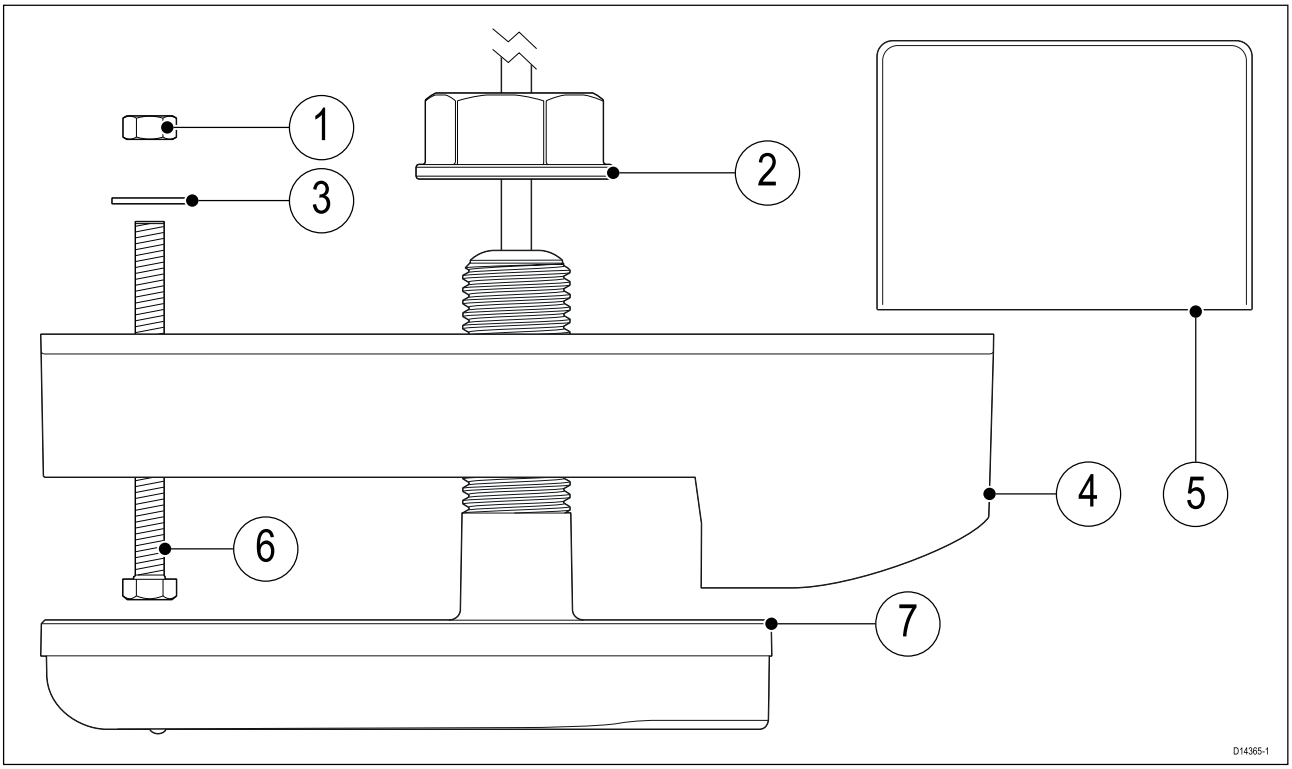


Part number	Description
E70532	Element 7 HV
E70534	Element 9 HV
E70536	Element 12 HV

2.5 Parts supplied

The following parts are supplied with each HV-300TH series transducer:

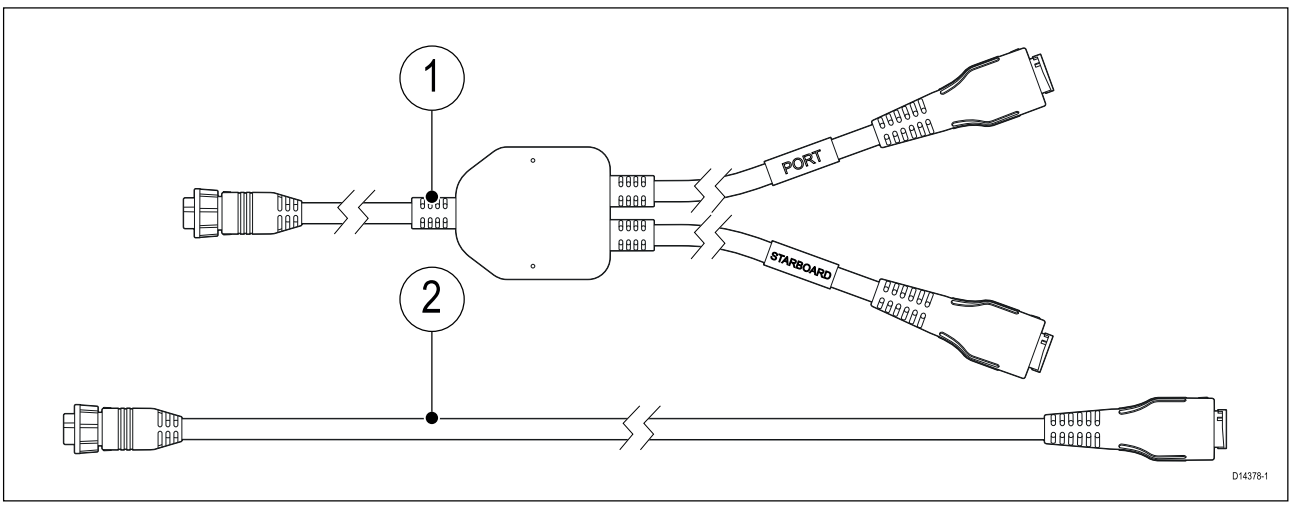
Unpack your product carefully to prevent damage or loss of parts. Check the box contents against the list below. Retain the packaging and documentation for future reference.



1	Anti-rotation nut
2	Hull nut
3	Anti-rotation washer
4	Fairing block
5	Documentation pack
6	Anti-rotation bolt
7	Transducer (with fitted cable)

Additional parts supplied

The following additional cables are supplied when ordering a split pair set of transducers: T70448 (**HV-300THP-P** and **HV-300THP-S**).



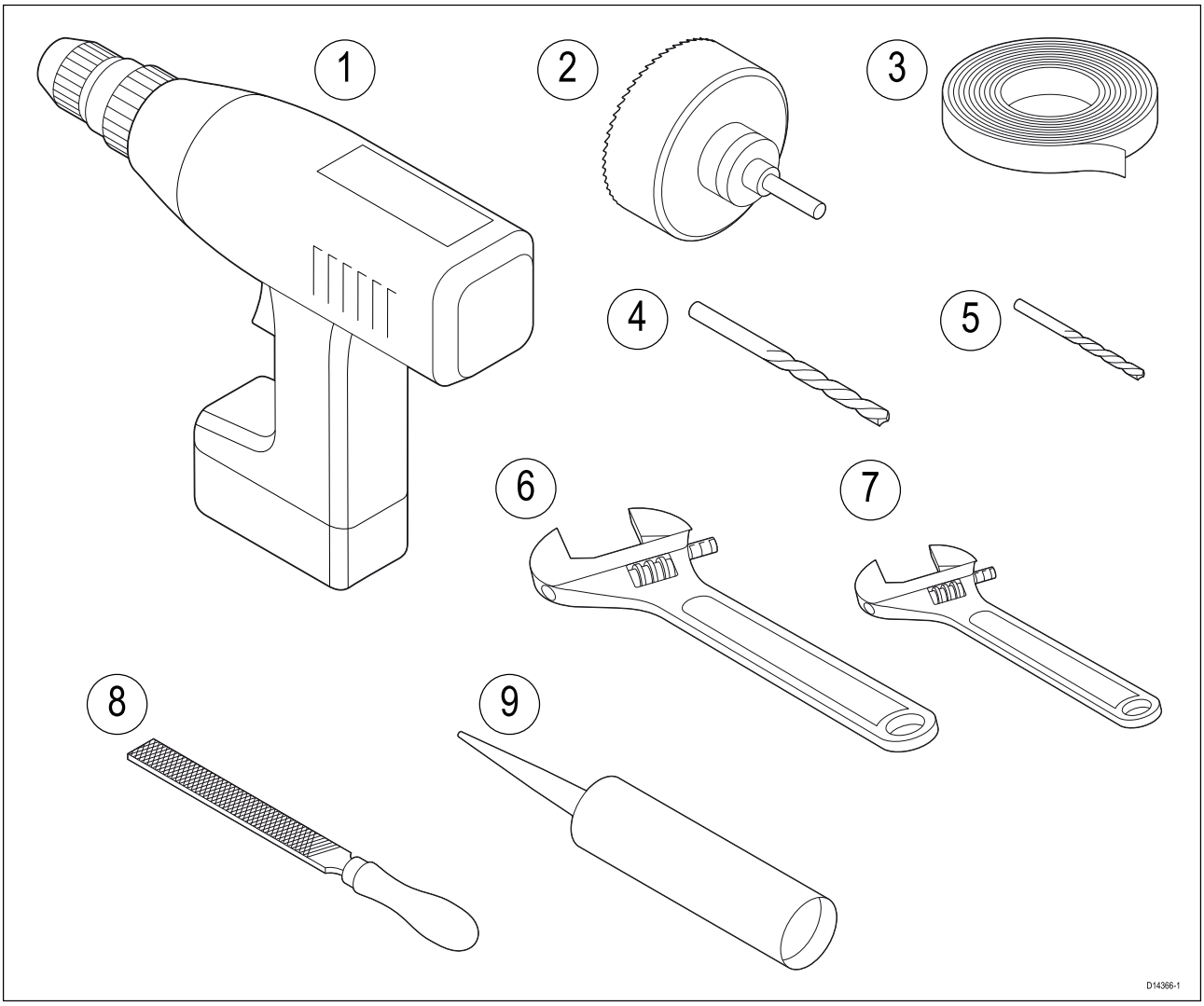
Item	Description	Quantity
1	“Y-cable” adapter for connecting a split pair of transducers to a HyperVision™ compatible display. Cable length: 0.3 m (0.98 ft.)	1
2	Extension cable 4 m (13.1 ft). In a split pair transducer configuration, extends the single end of the “Y-cable” adapter.	1

Chapter 3: Installation

Chapter contents

3.1 Tools required

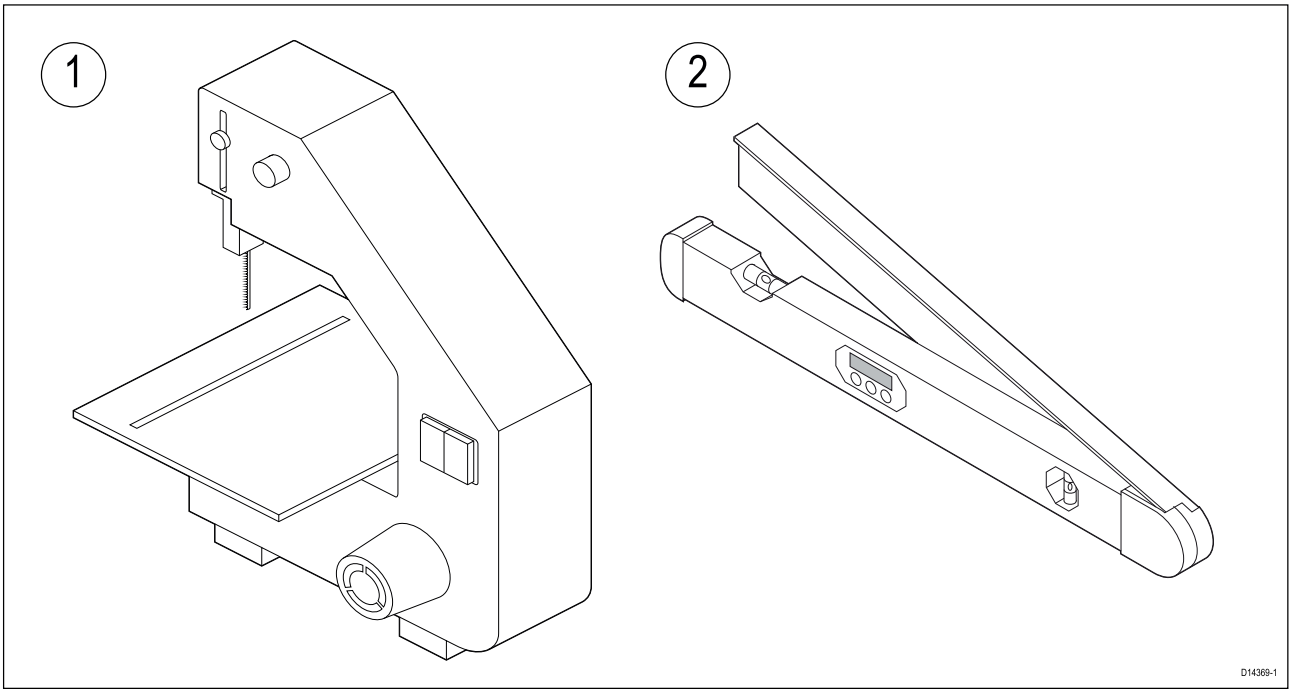
The following tools are required to install your transducer:



1	Power drill
2	32 mm (1 1/4 in) hole cutter (for transducer stem)
3	Adhesive tape
4	9 mm (11/32 in) drill bit (for anti-rotation hole)
5	Drill bit for pilot holes
6	44 mm (1 3/4 in) wrench or suitable adjustable wrench for hull nut
7	13 mm (1/2 in) wrench or suitable adjustable wrench for anti-rotation nut
8	Half-round file
9	Marine-grade sealant

Tools required for fairing block preparation

The tools below are required to identify hull dead rise angle and to cut the fairing block.



1	Band saw
2	Digital angle finder (if dead rise angle identification is required.

Warning: Marine-grade sealant

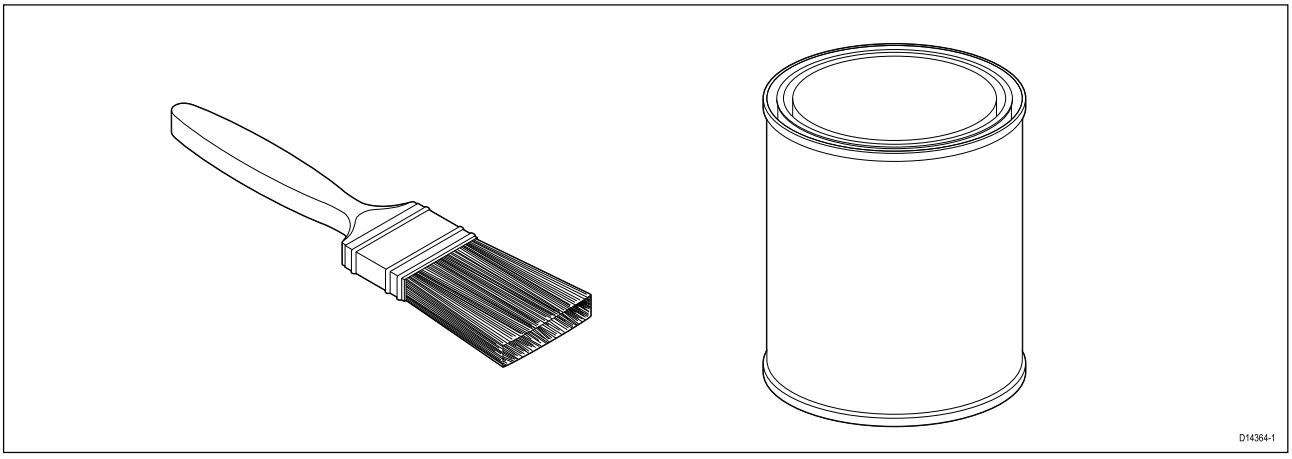
Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

Anti-fouling

Where local regulations allow, it is recommended that you coat your transducer using a water-based anti-fouling paint. This will help prevent the build-up of organic growth, which can reduce transducer performance.

Important:

- Before applying water-based anti-fouling paint, check that local environmental rules and regulations do not prohibit the use of anti-fouling paint.
- Never use copper-based anti-fouling paint as this can impact transducer performance.
- Never use keytone-based anti-fouling paint as this can attack the transducer's plastic, damaging the transducer.
- Paint your transducer using a brush, do not use a spray can or a sponge roller as these methods can cause tiny air bubbles to be incorporated in the paint, which will also reduce transducer performance.



The anti-fouling paint should be applied in a thin and even coat covering all externally exposed transducer surfaces.

You should clean your transducer regularly and re-apply anti-fouling paint every 6 months, or sooner depending on how rapidly organic growth builds up.

Refer to 6.2 **Transducer cleaning** for cleaning guidance.

For instructions on re-applying anti-fouling paint, refer to 6.3 **Re-applying anti-fouling paint**

3.2 Pre-installation test

Testing the transducer

Transducer operation should be checked before installation.

1. Connect the transducer to the transducer connection of a HyperVision™ compatible display (e.g. Element HV 9 display).
2. Fully submerge the transducer in water.
3. Power up your HyperVision™ display.

   The first time the display is powered up, or after a factory reset has been performed, the startup wizard is displayed. Transducer selection is part of the boat details options in the startup wizard.

4. Open a Fishfinder (Sonar) app on your display.
5. If required, select the relevant transducer from the Transducer settings tab (**Menu** > **Transducer** > **Transducer**).
6. Check that accurate depth and temperature readings are displayed.
7. If you experience difficulties obtaining readings then contact Raymarine Technical Support.

Warning: Transducer operation

Only test and operate the transducer in the water. Do NOT operate out of water as overheating may occur.

3.3 Selecting a location

Warnings and cautions

Important: Before proceeding, ensure that you have read and understood the warnings and cautions provided in the Chapter 1 **Important information** section of this document.

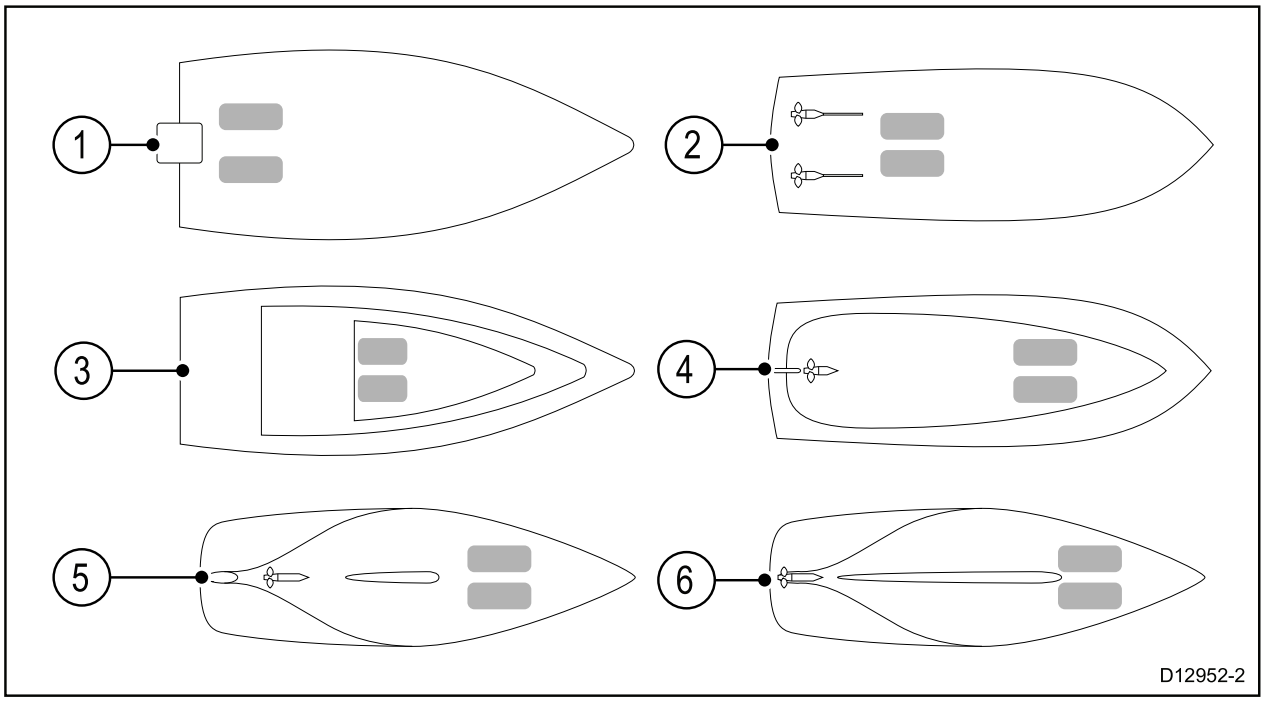
Location requirements

Follow the guidelines below when selecting a location for your single transducer or split-pair transducers.

For best performance, transducers should be installed in a location with the least turbulence and aeration.

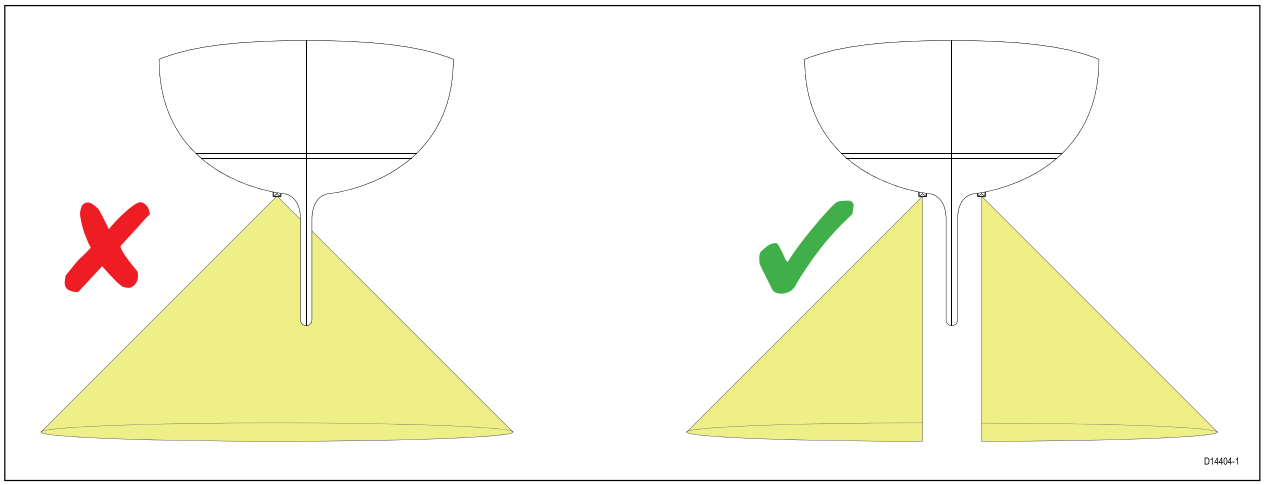
Important: Do NOT install transducers in-line with trailer rollers, your vessel's engine intake or discharge openings.

- Transducers should be installed as close to the center line of the vessel as possible.

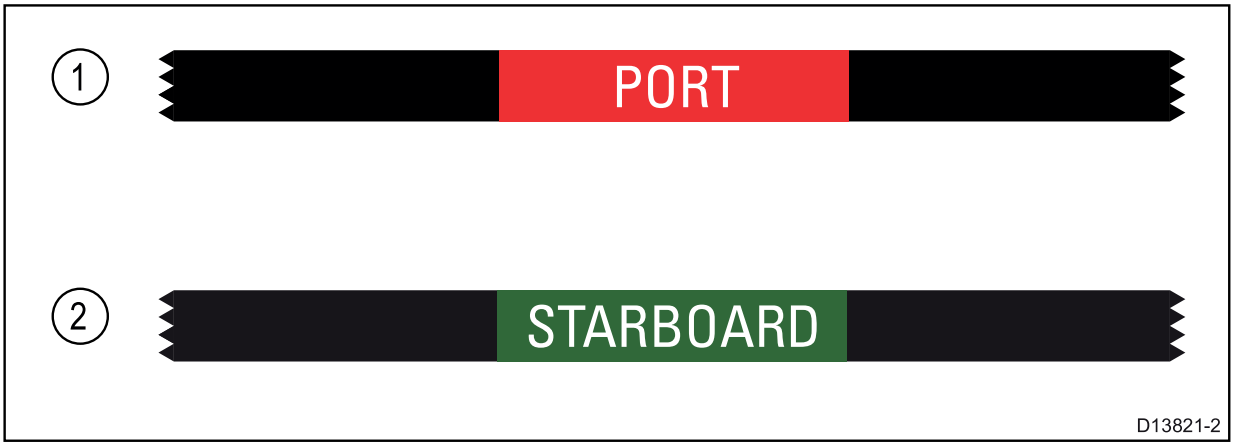


1	Planing hull	**Outboard or I/O** — mount forward and to the side of the propeller(s).
2	Planing hull	**Inboard** — mount forward of the propeller(s) and shaft(s).
3	Planing hull	**Stepped hull** — mount on the first step as far aft as possible.
4	Displacement hull	**Displacement hull** — mount approximately 1/3 of the way along the length of the hull, measured along the waterline.
5	Keel sailboat	**Fin keel** — mount forward of the keel, ensuring that the keel will not obstruct the transducers wide beam width.
6	Keel sailboat	**Full keel** — mount away from the keel at a location with minimum dead rise, ensuring that the keel will not obstruct the transducers wide beam width.

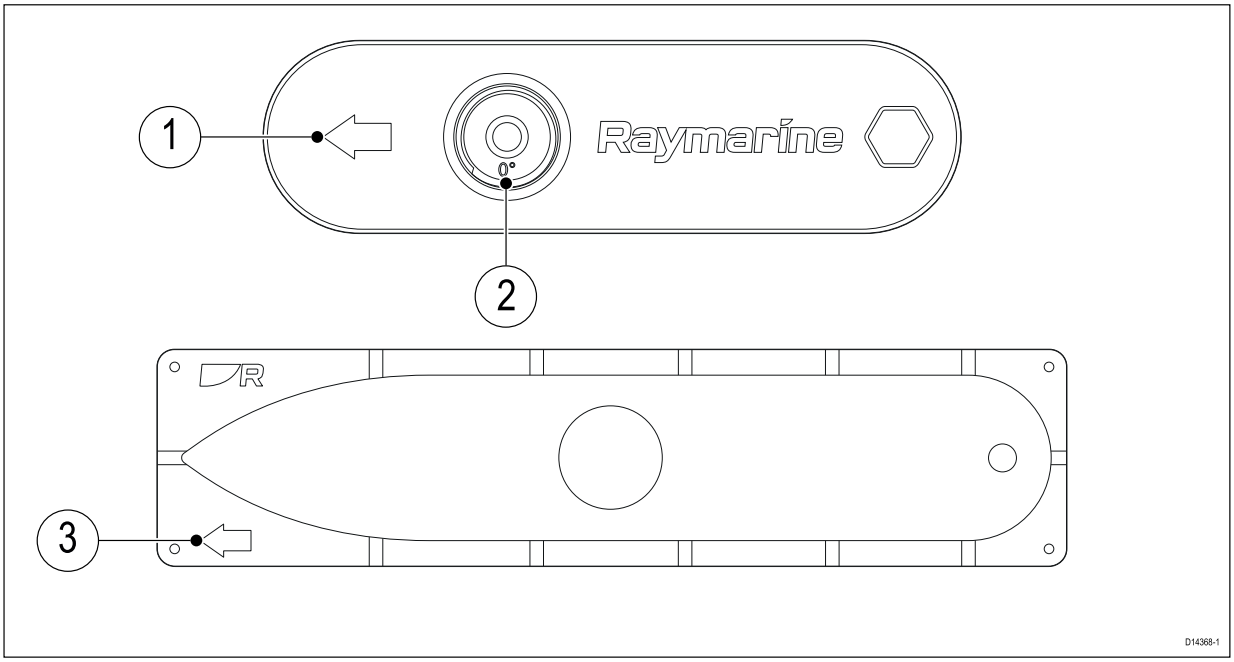
- When installing split-pair transducers, the fairing block must be cut to the dead rise angle of the hull, ensuring that the transducer elements point straight down.
- When fitting to a hull with a keel, ensure that the transducer beam will not be obstructed by the keel. If the transducer cannot be fitted fore or aft of the keel then use split pair transducers to overcome the obstruction.



- The transducers should be installed away from any protrusions such as other transducers, steps, ribs, strakes, or rows of rivets.
- Transducers should be installed in a location where no load will be applied to the transducers during, launching, lifting, trailering and storage of the boat.
- Transducers must be installed in the correct orientation, with the anti-rotation bolt closest to the stern of the vessel. Additionally, a direction arrow pointing to the bow is embossed on the transducer.
- When installing split-pair transducers:
  - the correct transducer (port or starboard) must be installed in the matching (port or starboard) side of the hull; each transducer in a split pair has a label on the attached cable, and markings on the top of the transducer stem to help you identify the transducer and orientation:



Item	Color	Description
1	Red	Port-side split-pair transducer cable
2	Green	Starboard-side split-pair transducer cable



Item	Description
1	Transducer identifier (direction to vessel bow)
2	Element angle or side: (port, “P”; starboard, “S”) Single (all-in-one) transducers are marked “0°”
3	Fairing block identifier (direction to vessel bow)

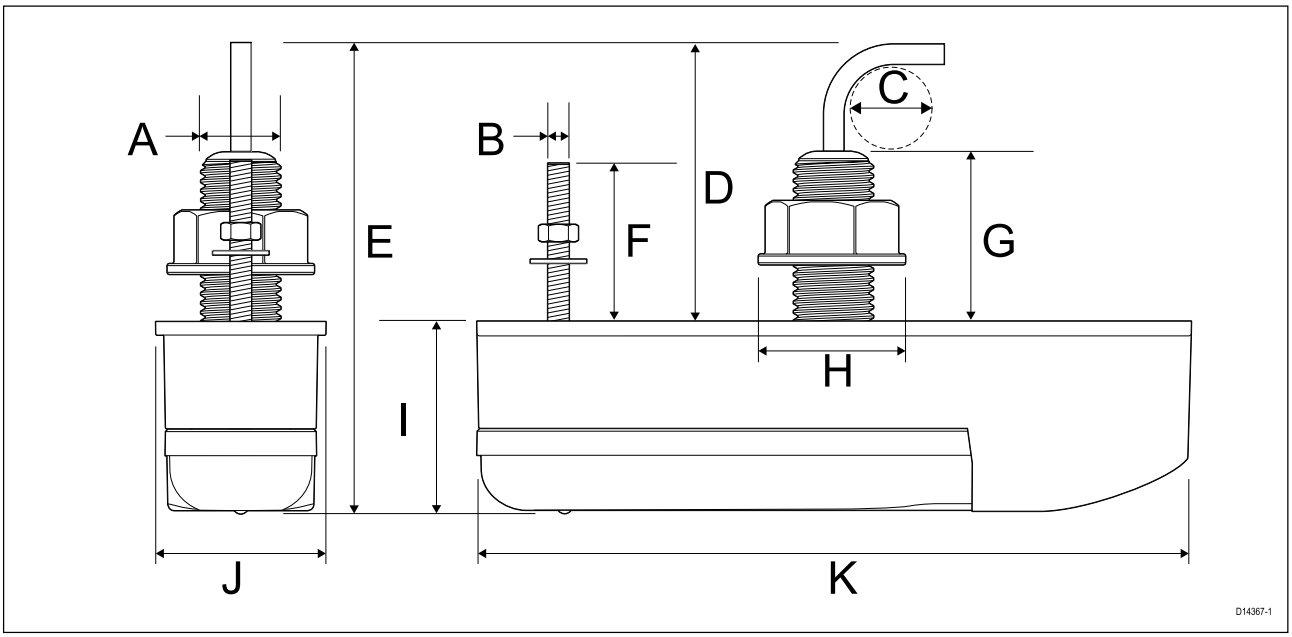
  - choose mounting positions that are symmetric about the center line of the vessel.
  - choose mounting positions that are at least 300 mm (12 inches) below the water line.
- Transducers should be installed in a location where there is sufficient clearance inside the hull to fit the nut and have at least 100 mm (4 in) of headroom to allow for withdrawal.
- To avoid interference with the internal magnetometer, mount transducers at least 1 m (39 inches) from other electrical devices.

Cored fiberglass hull mounting

It is recommended that the transducer is mounted in a non-cored section, if installation in a cored section is required then the area around the hole must be adequately strengthened to ensure it is not damaged when tightening the hull and anti-rotation nuts.

Important: Installation in a cored fiberglass hull should only be carried out by a competent marine installer.

Product dimensions



A	30.00 mm (1.18 in)	G	63.47 mm (2.50 in)
B	8.00 mm (0.31 in)	H	55.00 mm (2.17 in)
C	85.00 mm (3.35 in)	I	71.88 mm (2.83 in)
D	148.48 mm (5.85 in)	J	63.60 mm (2.50 in)
E	220.36 mm (8.68 in)	K	267.00 mm (10.51 in)
F	59.00 mm (2.32 in)		

Transducer cable length

The length of the cable fitted to the transducer is:

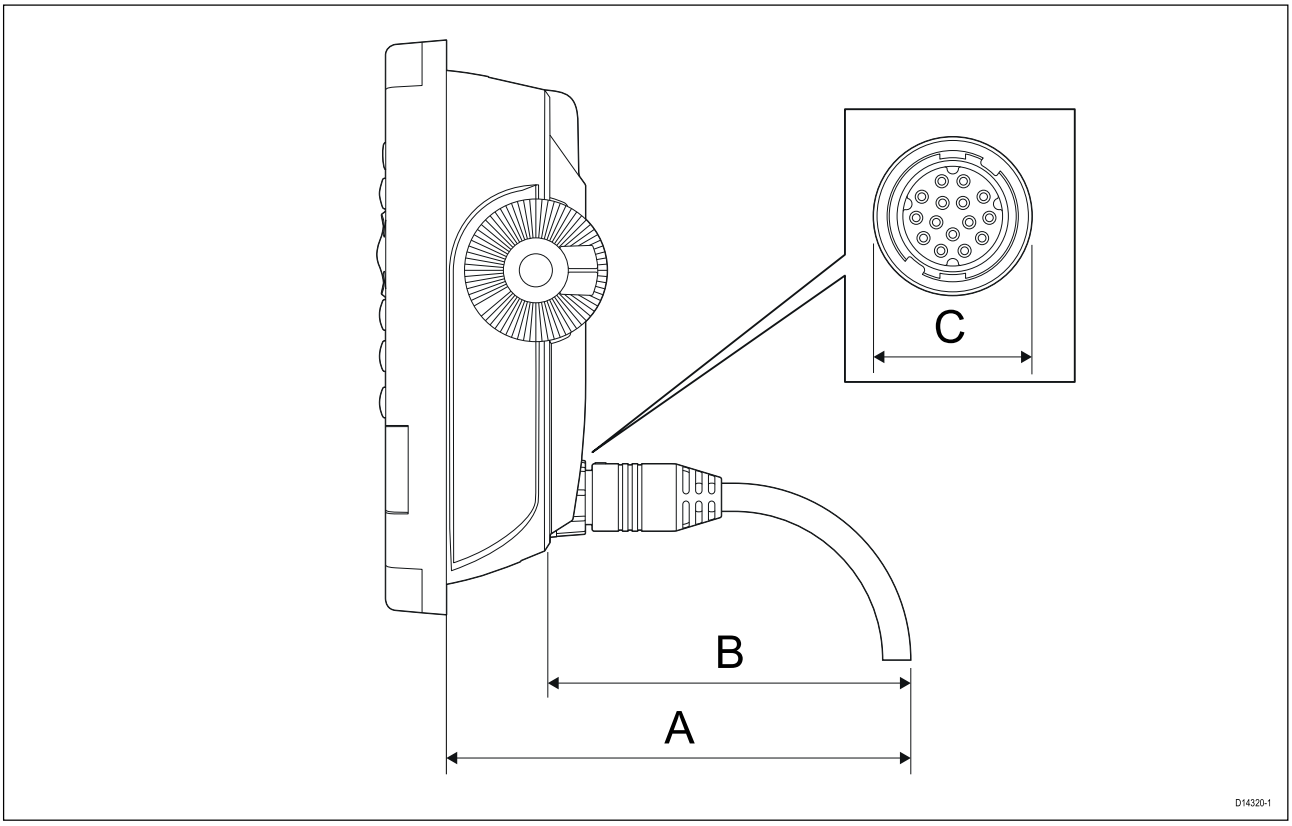
- **HV-300TH** — 6 m (19.69 ft).
- **HV-300THP-S** and **HV-300THP-P** — 2 m (6.5 ft).
- A 4 m (13.12 ft) HyperVision™ transducer extension cable (A80562) is available.
- It is recommended that a maximum of one cable extension is used.

Note:

When ordering the split pair transducer system pack (T70448) a 0.3 m (0.98 ft.) 'Y' splitter cable (A80605) and a 4 m (13.12 ft) extension cable (A80562) are also supplied.

Nut sizes

- Hull nut — 44 mm (1.73 in) across flats
- Anti-rotation nut — 13 mm (0.51 in.) across flats



A	130.00 mm (5.12 in)
B	85.00 mm (3.35 in)
C	22.20 mm (0.87 in)

EMC installation guidelines

Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations, to minimize electromagnetic interference between equipment and minimize the effect such interference could have on the performance of your system

Correct installation is required to ensure that EMC performance is not compromised.

Note: In areas of extreme EMC interference, some slight interference may be noticed on the product. Where this occurs the product and the source of the interference should be separated by a greater distance.

For **optimum** EMC performance we recommend that wherever possible:

- Raymarine equipment and cables connected to it are:
  - At least 1 m (3.3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (6.6 ft).
  - More than 2 m (6.6 ft) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The product is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

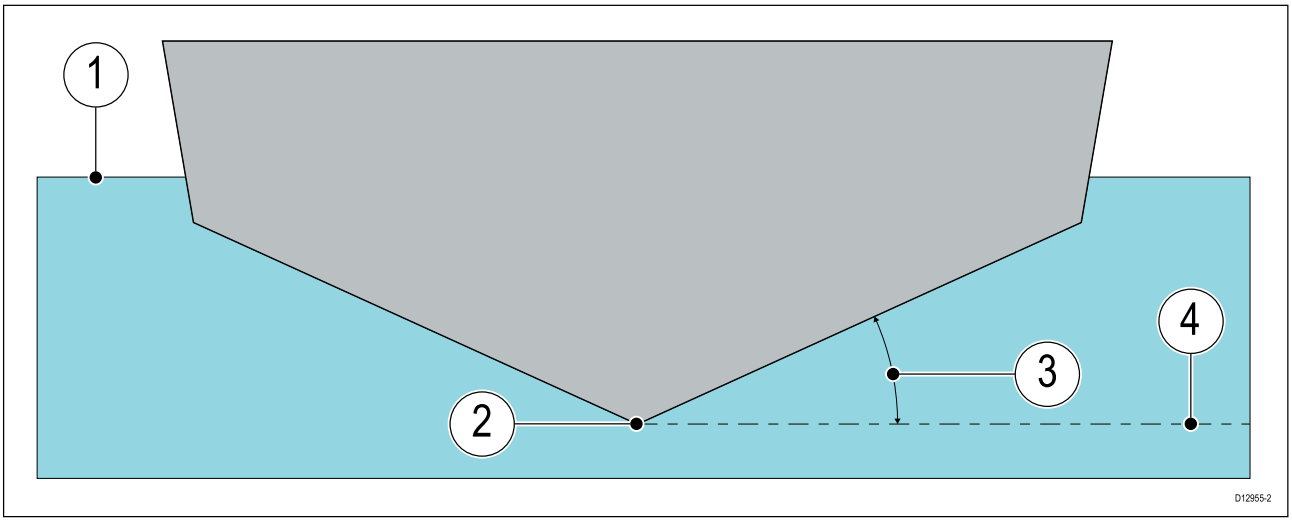
Note:

Where constraints on the installation prevent any of the above recommendations, always ensure the maximum possible separation between different items of electrical equipment, to provide the best conditions for EMC performance throughout the installation.

3.4 Mounting

Dead rise angle

The dead rise angle is the angle of your vessel's hull measured from the centerline. The transducer can be installed on vessels with a dead rise angle of 0° to 25°. The transducer should not be installed on vessels with a dead rise angle greater than 25°.

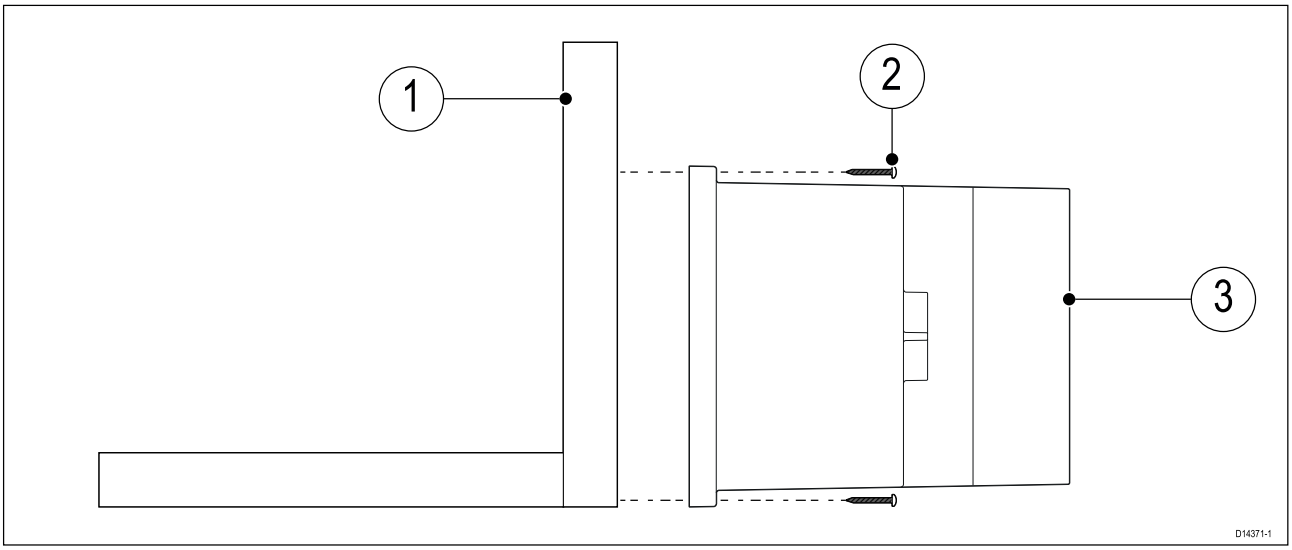


1	Waterline
2	Centerline
3	Dead Rise Angle
4	Parallel with waterline

The dead rise angle should be measured on the outside of the hull using an angle finder or similar device.

Cutting guide

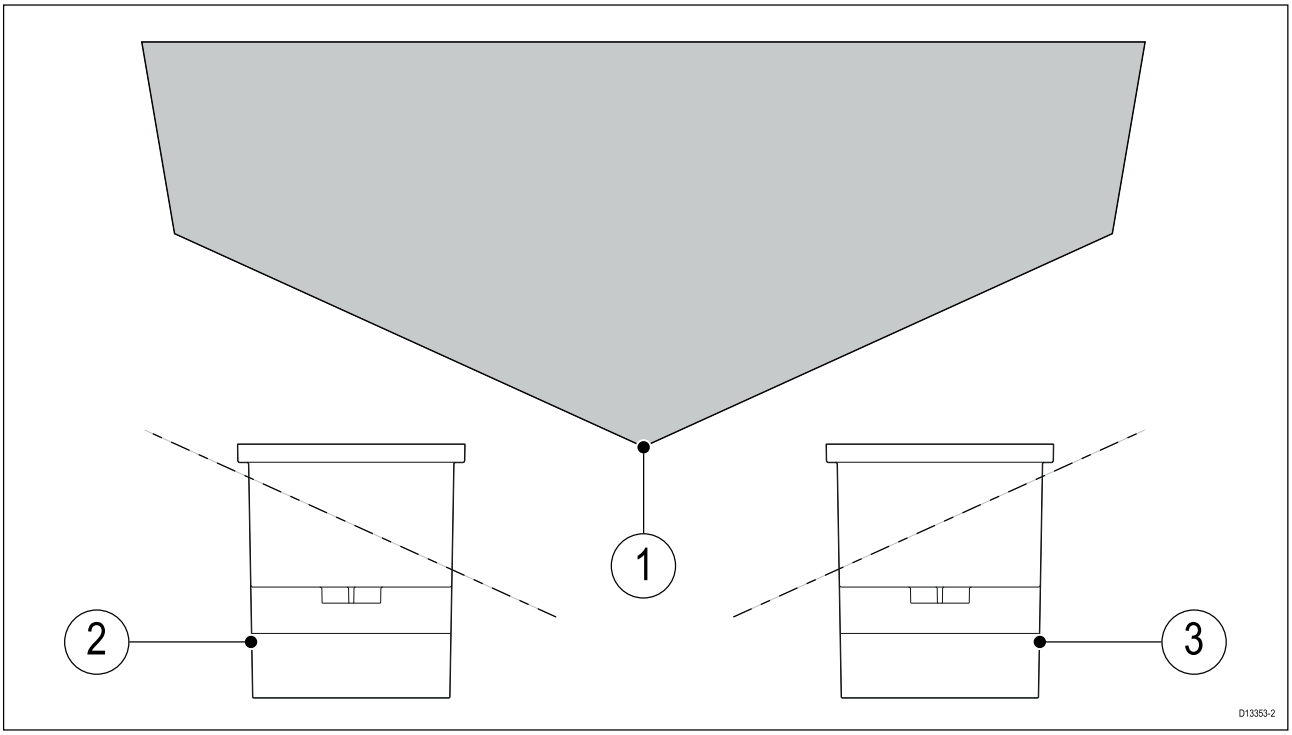
You can use a bespoke cutting guide to help you guide your fairing block through the band saw.



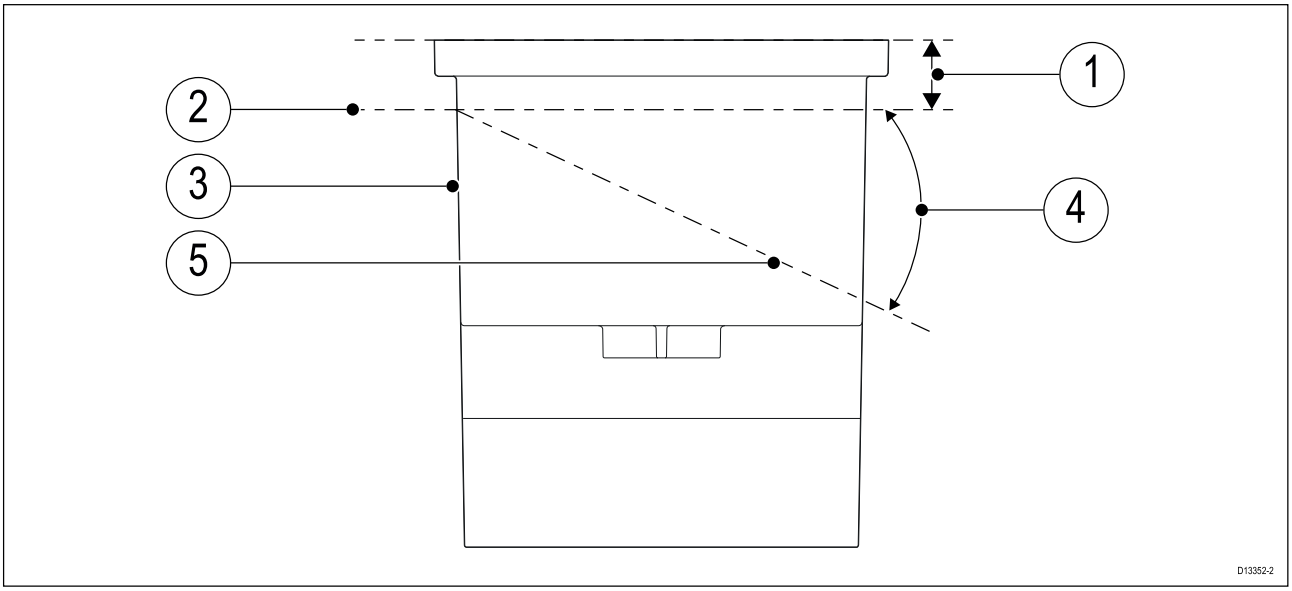
1	Bespoke cutting guide (not supplied)
2	4 x screws (not supplied)
3	Fairing block (supplied)

Cutting the fairing block

The fairing must be cut to the angle and shape of your hull.



1	Vessel hull (viewed from the rear)
2	Cut for starboard side installation
3	Cut for port side installation



1	Fence to blade distance
2	Parallel to waterline
3	Fairing block (viewed from the rear)
4	Dead rise angle 0° to 25°
5	Example slope of hull

1. Calculate the dead rise angle.

   The dead rise angle should be measured on the outside of the hull from the location that the transducer is to be mounted using an angle finder or similar device.

2. Adjust the band saw table to the required dead rise angle.

3. Adjust the band saw's fence to be the distance specified in the *fence to blade* table added to the width of your cutting guide, if used.

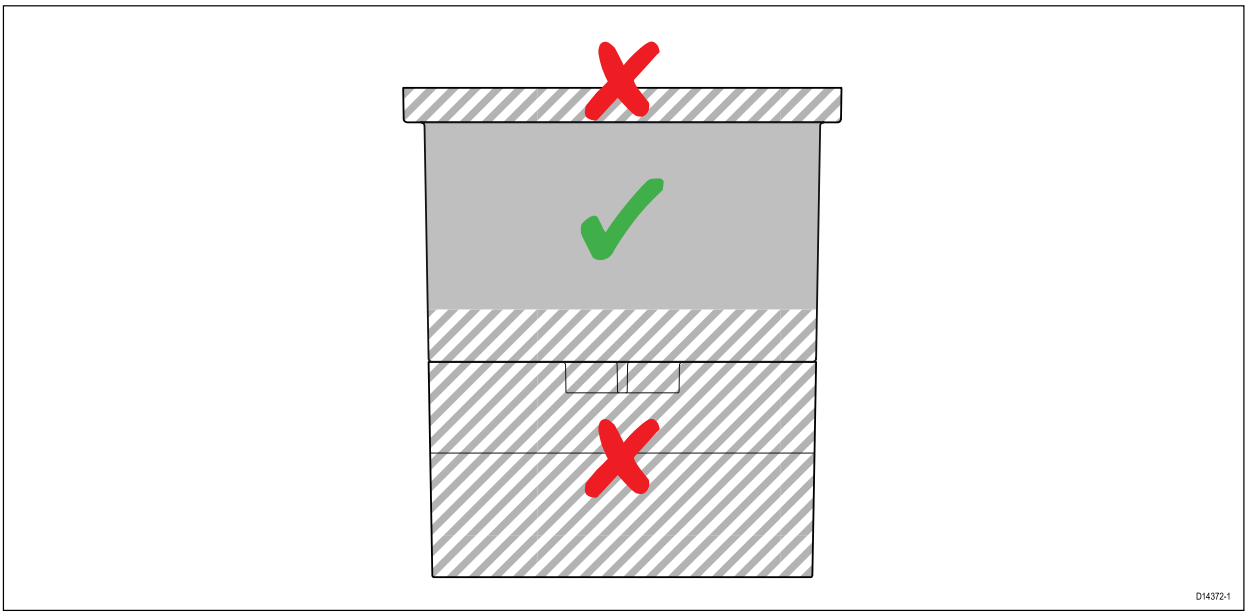
   Using the fence to blade table measurements ensures that the cut will be made at an appropriate place on the fairing, producing 2 equally sized parts.

4. Position the block against the fence so that the top face of the block is closest to the fence.

Important:

When installed the pointed end of the fairing must point towards the bow. Ensure that the fairing is orientated correctly on the band saw table so that the correct angle is cut for the side you are installing. When cutting the port side fairing the pointed end of the fairing should be pointing away from you, when cutting the starboard side fairing the pointed end should be pointing towards you.

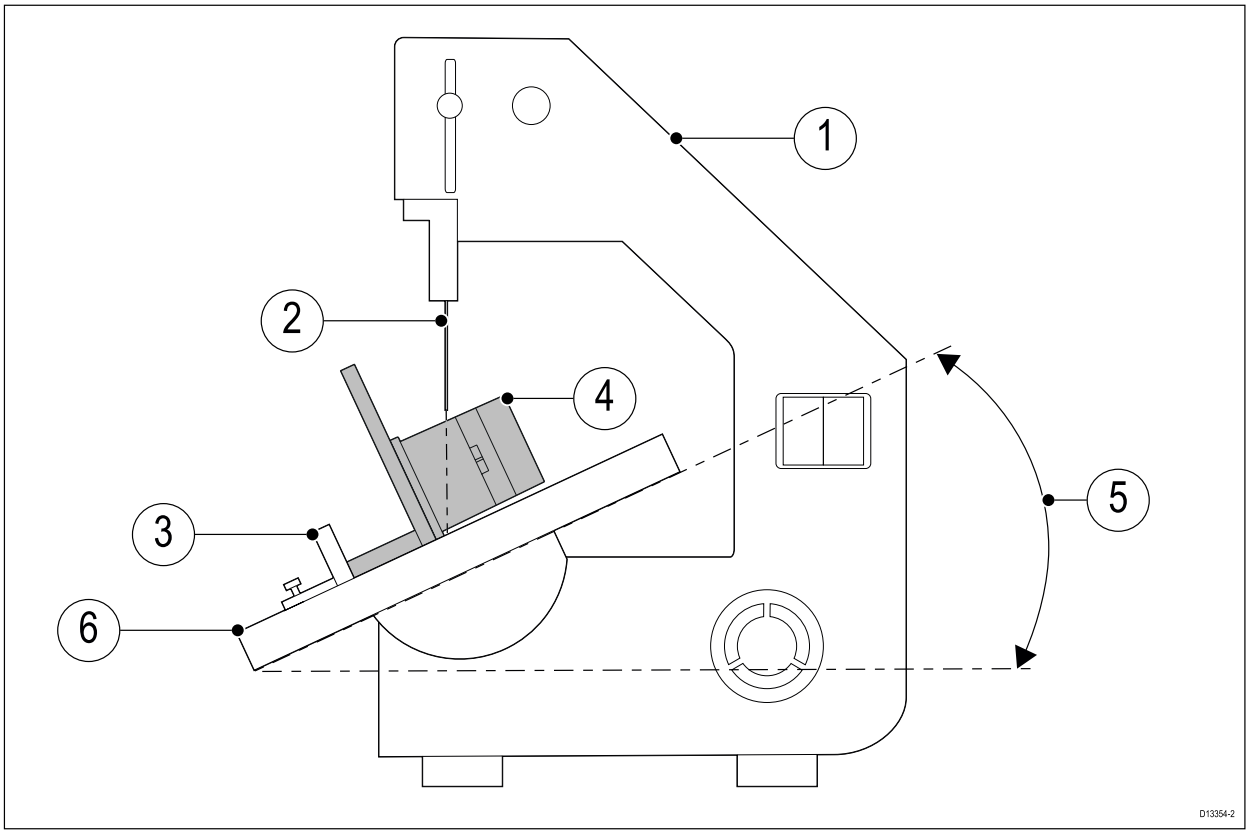
5. Ensure that the cut will be made within the acceptable cutting area of the fairing.



Important:

Only cut in the shaded area. Do NOT cut in the hatched areas.

6. Recheck steps 1 to 5.
7. Cut the block.



1	*Band saw*
2	*Blade*
3	*Fence*
4	*Fairing block with cutting guide attached*
5	*Dead rise angle*
6	*Band saw table*

Retain the top half of the block as this will provide a level surface inside the hull to tighten the nuts against.

8. Check the bottom half of the block against the hull to ensure a good fit.

   Ensure that the block runs parallel to the centerline of the vessel.

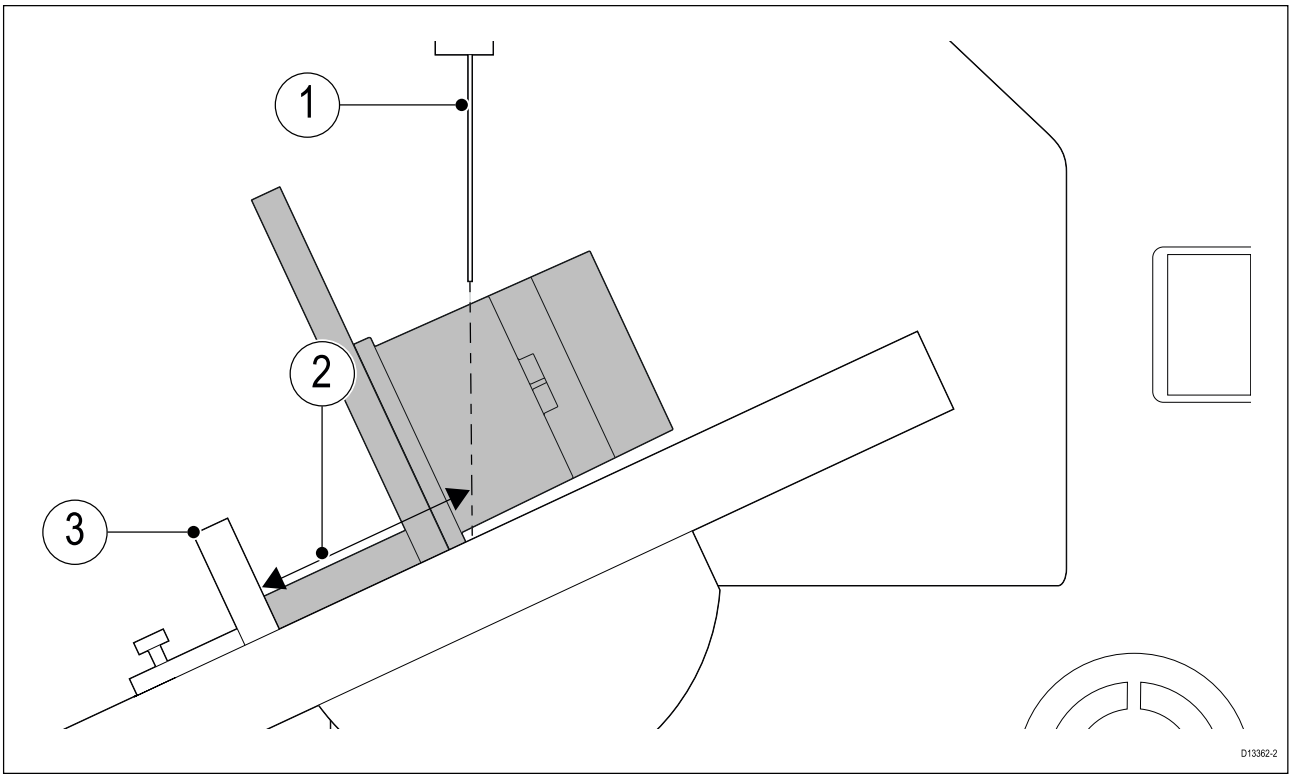
9. If there are gaps between the block and hull then use an appropriate file to shape the block until a precision fit is achieved.

Band saw fence to blade distance

The table below identifies the distance to set the band saw's fence from the blade depending on the dead rise angle of your hull. If you have used a cutting guide then you will need to add the cutting guide's width to the fence to blade distance.

Important:

When using a cutting guide you must add the width of your cutting guide to the stated fence to blade distance for your selected dead rise angle.



1	Blade
2	Fence to blade distance
3	Fence

Dead rise angle	Fence to blade distance	Dead rise angle	Fence to blade distance
0°	18.5 mm	13°	12.1 mm
1°	18.0 mm	14°	11.6 mm
2°	17.5 mm	15°	11.1 mm
3°	17.1 mm	16°	10.6 mm
4°	16.6 mm	17°	10.0 mm
5°	16.1 mm	18°	9.5 mm
6°	15.6 mm	19°	9.0 mm
7°	15.1 mm	20°	8.4 mm
8°	14.6 mm	21°	7.9 mm
9°	14.1 mm	22°	7.3 mm
10°	13.6 mm	23°	6.8 mm
11°	13.1 mm	24°	6.2 mm
12°	12.6 mm	25°	5.6 mm

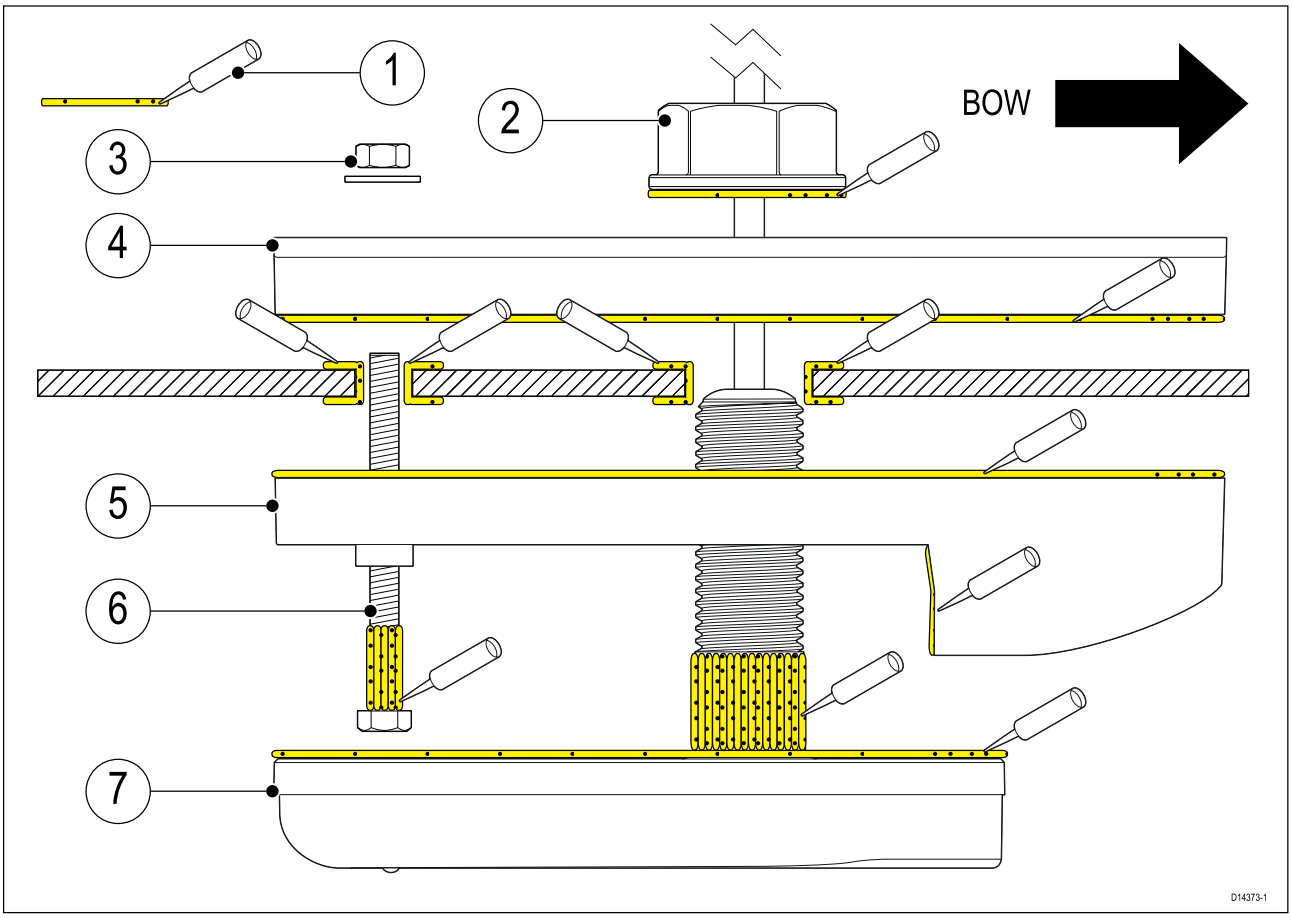
Mounting the transducer

The transducer should be mounted following the steps below.

Important:

- Only perform the installation with your vessel out of the water.
- Do NOT lift or suspend the transducer using its cable.
- Ensure that the transducer body is supported during installation.
- Do NOT remove the label attached to the transducer cable, as it helps to ensure correct connection.

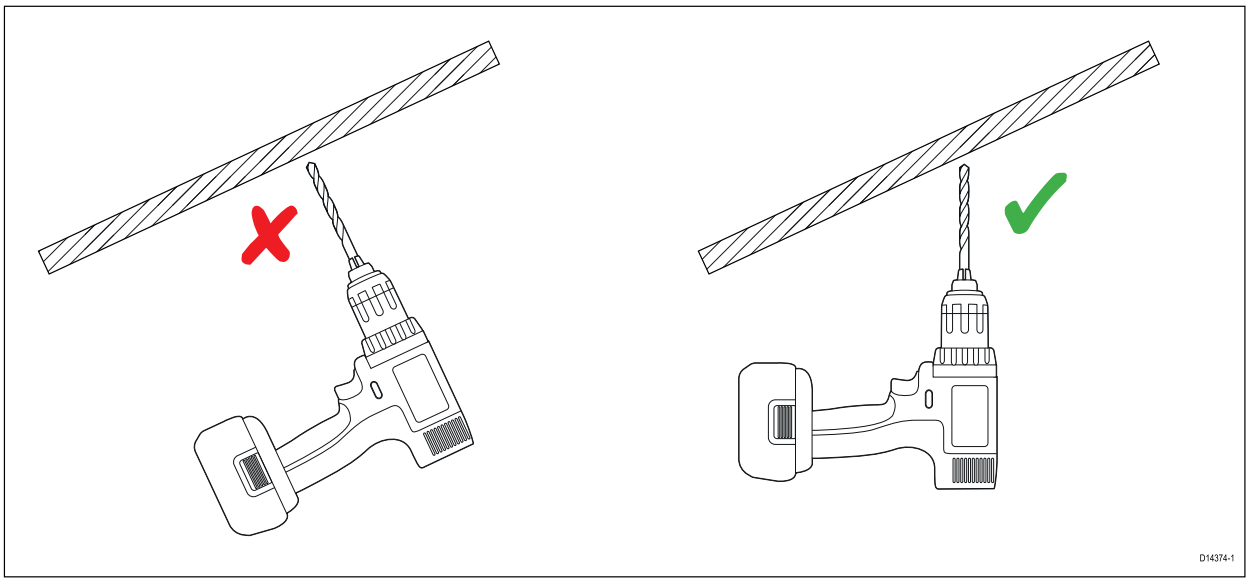
- Do NOT overtighten the hull nut or anti-rotation bolt. Overtightening can cause damage to the hull and / or transducer which may result in water leaking into the vessel.



1	Represents areas where marine-grade sealant is to be applied
2	Plastic hull nut
3	Anti-rotation nut and washer
4	Top half of fairing block
5	Bottom half of fairing block
6	Anti-rotation bolt
7	Transducer

1. Check the top of the transducer stem to confirm that you are using the correct type of transducer (port “P”, starboard (S) or all–in–one “0°”) for your chosen mounting location.
2. Align the bottom half of the fairing block on the hull so that it is parallel to the centerline (keel) of the vessel, ensuring that the pointed end of the fairing is pointed towards the bow.
3. Using a permanent marker, draw around the outside edge of the fairing block and the internal holes for the transducer stem and anti-rotation bolt.
4. Remove the fairing block from the hull.

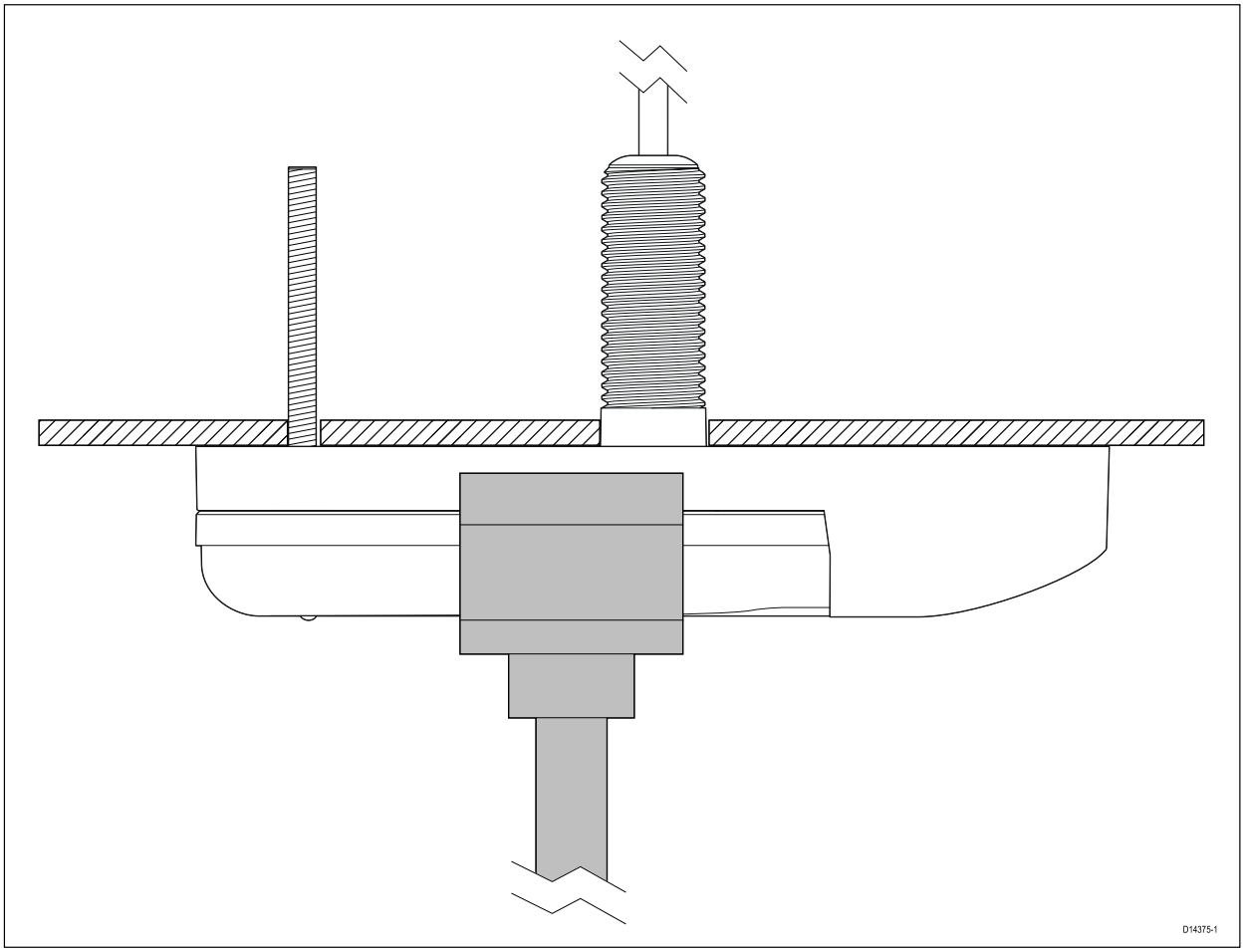
5. Drill a pilot hole in the center of the location marked out for the transducer stem.



When drilling holes in hulls that have a dead rise, ensure that holes are drilled straight up and not at the angle of your hull.

6. Drill the stem hole using a 32 mm (1 1/4 in) hole cutter.
7. Using a half round file and / or sandpaper, ensure there are no rough edges or burrs around the transducer stem hole.
8. Wipe the mounting location and transducer stem hole with an appropriate cleaning agent (for example: isopropyl alcohol), and ensure the surfaces are dry, clean and free from debris.
9. Guide the transducer cable through the hole and ensure that the transducer stem fits in the hole.
10. Remove the transducer and cable from the hull.
11. Drill a 9 mm (11/32 in) hole in the center of the location marked out for the anti-rotation bolt hole.
12. Check the anti-rotation bolt fits in the hole.
13. Wipe the top face of the transducer, the transducer stem, the anti-rotation bolt and the bottom face of the bottom half of the fairing block with an appropriate cleaning agent (for example: isopropyl alcohol), and ensure the surfaces are dry, clean and free from debris.
14. Guide the transducer cable through the stem hole in the bottom half of the fairing block.
15. Apply a thick bead of marine-grade sealant:
    i. in a continuous bead, all around the perimeter of the top face of the transducer.
    ii. all over the top face of the transducer.
    iii. all around the base of the transducer stem, ensuring that the sealant will protrude approximately 6 mm above the final tightened nut.
    iv. all over the bottom face of the bottom half of the fairing block and all over the vertical circular recess area.
    v. around the stem of the anti-rotation bolt, close to the head of the bolt.
16. Insert the anti-rotation bolt into the anti-rotation hole in the bottom half of the fairing block.
17. Push the fairing block down onto the transducer ensuring that the anti-rotation locator is aligned with the anti-rotation bolt locator on the top face of the transducer.
18. Wipe off any excess sealant protruding from the edge of the transducer / fairing block.
19. Wipe the top face of the bottom half of the fairing block and the mounting location on the hull with an appropriate cleaning agent (for example: isopropyl alcohol), and ensure the surfaces are dry, clean and free from debris.
20. Apply a continuous, thick bead of marine-grade sealant all around the perimeter and across the top of the top face of the bottom half of the fairing block, where it will meet the hull.
21. Apply a thick bead of marine-grade sealant all around the edges of the holes in the hull.
22. Guide the transducer cable up through the stem hole in the hull.

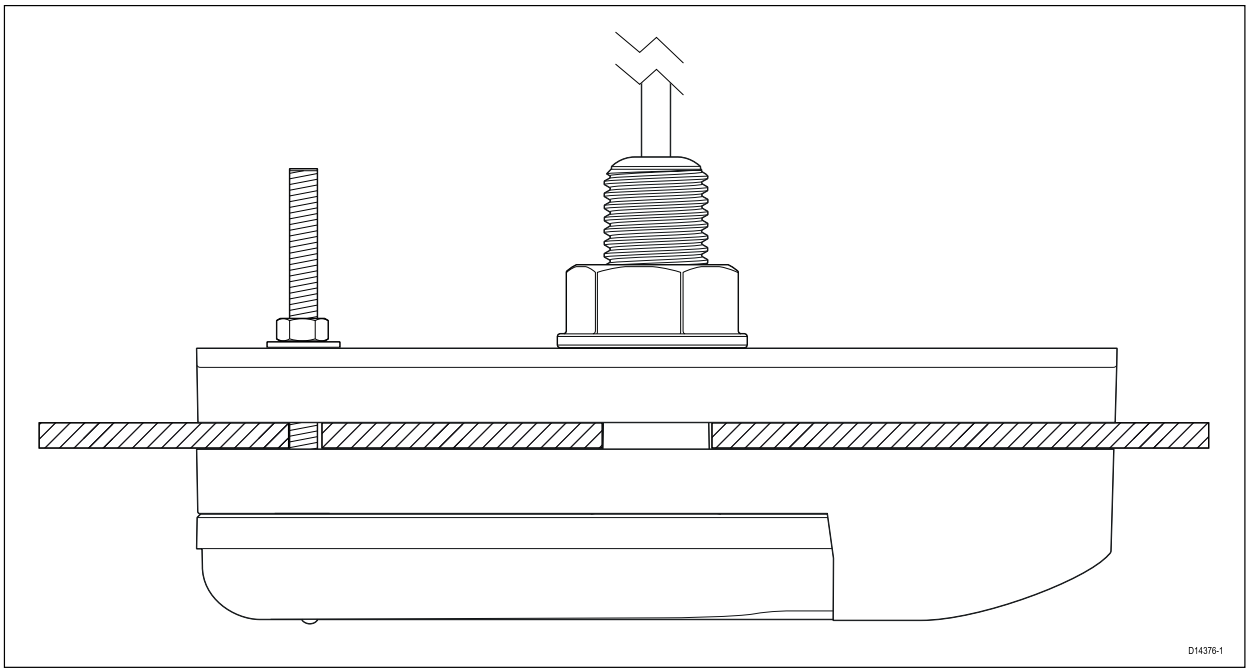
23. Guide the transducer stem and anti-rotation bolt up through the holes in the hull and support the transducer from beneath.



24. From inside the hull, guide the transducer cable through the stem hole in the top half of the fairing block.
25. Wipe the bottom face of the top half of the fairing block and around the mounting location on the inside surface of the hull with an appropriate cleaning agent (for example: isopropyl alcohol), and ensure the surfaces are dry, clean and free from debris.
26. Apply a thick bead of marine-grade sealant:
    i. in a continuous bead all around the perimeter of the bottom face of the top half of the fairing block
    ii. all over the bottom face of the top half of the fairing block.
    iii. around the stem hole and anti-rotation holes in the hull.
27. Place the top half of the fairing block over the anti-rotation bolt and transducer stem.
28. Push the top half of the fairing block down against the hull.
29. If required, apply additional marine-grade sealant around the base of the transducer stem and anti-rotation bolt.
30. Guide the transducer cable through the hull nut
31. Apply a continuous, thick bead of marine-grade sealant to the bottom of the plastic hull nut.
32. Ensuring that the fairing block pieces and transducer do not move, secure the transducer assembly by tightening the hull nut by hand.
33. Slide the washer over the anti-rotation bolt.
34. Screw the anti-rotation nut onto the bolt and tighten, using a 13 mm (1/2 in) wrench (spanner).
35. Add a further quarter turn using a 44 mm (1 3/4 in) wrench (spanner).

In order to prevent leaks and transducer movement when hit by objects or waves, ensure that the nut is adequately tightened. You should see the sealant protruding from the edges of the applied surfaces.

36. Remove any excess marine-grade sealant.



37. Ensure that the marine-grade sealant has fully cured

    Refer to the sealant manufacturer's instructions for curing times.

38. Unless local environmental regulations prohibit, apply a water based anti-fouling paint to the bottom face of the transducer, ensuring all of the externally exposed transducer surfaces are coated and the paint overlaps onto the hull.
39. Check for leaks around the transducer immediately upon putting the vessel back in the water.

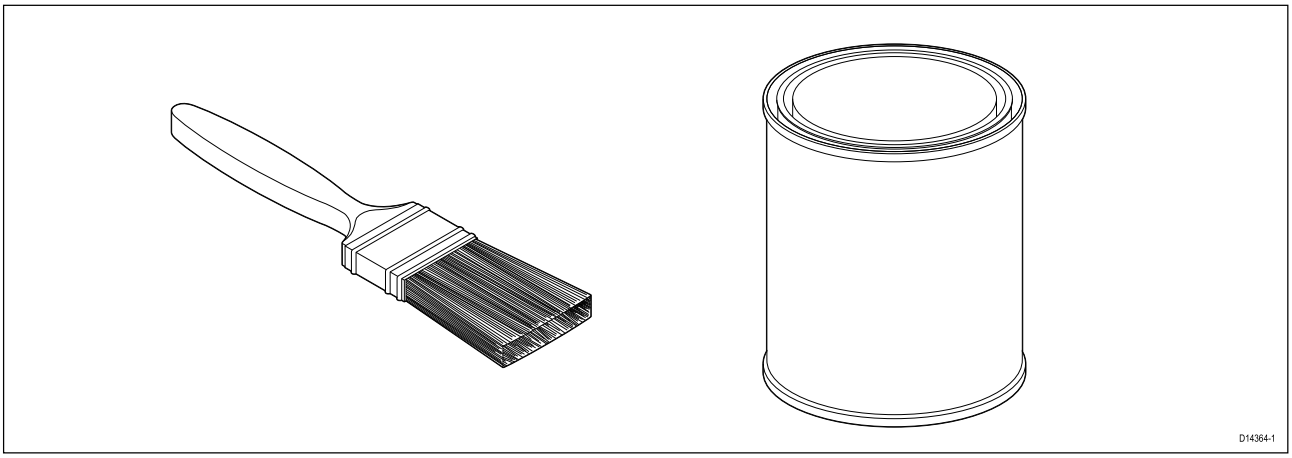
    Do NOT leave your vessel in the water unchecked after installing your transducer. Very small leaks may not be immediately obvious, and considerable bilge water could accumulate over the course of a day, or overnight.
40. Check for leaks at regular intervals after installation until you are satisfied that there are no leaks.
41. Ensure checking for leaks around the transducer is added to your routine vessel maintenance schedule.

Anti-fouling

Where local regulations allow, it is recommended that you coat your transducer using a water-based anti-fouling paint. This will help prevent the build-up of organic growth, which can reduce transducer performance.

Important:

- Before applying water-based anti-fouling paint, check that local environmental rules and regulations do not prohibit the use of anti-fouling paint.
- Never use copper-based anti-fouling paint as this can impact transducer performance.
- Never use keytone-based anti-fouling paint as this can attack the transducer's plastic, damaging the transducer.
- Paint your transducer using a brush, do not use a spray can or a sponge roller as these methods can cause tiny air bubbles to be incorporated in the paint, which will also reduce transducer performance.



The anti-fouling paint should be applied in a thin and even coat covering all externally exposed transducer surfaces.

You should clean your transducer regularly and re-apply anti-fouling paint every 6 months, or sooner depending on how rapidly organic growth builds up.

Refer to 6.2 **Transducer cleaning** for cleaning guidance.

For instructions on re-applying anti-fouling paint, refer to 6.3 **Re-applying anti-fouling paint**

Chapter 4: Connections

Chapter contents

4.1 General cabling guidance

Cable types and length

It is important to use cables of the appropriate type and length.

- Unless otherwise stated only use cables supplied by Raymarine.
- Where it is necessary to use non-Raymarine cables, ensure that they are of correct quality and gauge for their intended purpose. (e.g.: longer power cable runs may require larger wire gauges to minimize voltage drop along the run).

Strain relief

Use adequate strain relief for cabling to ensure that connectors are protected from strain and will not pull out under extreme sea conditions.

Cable shielding

Ensure that cable shielding is not damaged and that all cables are properly shielded.

Caution: Transducer cable

- Do NOT use the transducer cable to lift or suspend the transducer; always support the transducer body directly during installation.
- Do NOT cut, shorten, or splice the transducer cable.
- Do NOT remove the connector.

If the cable is cut, it cannot be repaired. Cutting the cable will also void the warranty.

4.2 Cable routing

Cable routing requirements for the transducer cable.

Important:

To avoid interference, the cable must be routed as far away from VHF radio antenna devices and cables as possible.

- Check that the cable is long enough to reach the display it will be connected to. Optional extension cables are available, if required.
- Ensure there is enough slack in the transducer cable, at the transducer end, to allow the transducer to pivot up and down during adjustment.
- If you intend to route the cable through the transom then you should use the supplied escutcheon plate to cover the hole..
- Secure the cable at regular intervals using the supplied cable clips.
- Any excess cable should be coiled up at a convenient location.

HV–300 transducer extension cable

For best performance, cable runs should be kept to a minimum. However, for some installations it may be necessary to extend the transducer cable.

A 4 m (13.12 ft) HyperVision™ transducer extension cable (A80562) is available

It is recommended that a maximum of one cable extensions is used, with the total cable run to each transducer not exceeding 6.3 m (20.67 ft).

4.3 Making connections

Follow the steps below to connect the cable(s) to your product.

1. Ensure that the vessel's power supply is switched off.
2. Ensure that the device being connected to the unit has been installed in accordance with the installation instructions supplied with that device.
3. Ensuring correct orientation, push the cable connector fully onto the corresponding connector on the unit.
4. Turn the locking collar clockwise to secure the cable.

Chapter 5: System checks and troubleshooting

Chapter contents

5.1 Operation instructions

For detailed operation instructions for your product, refer to the documentation that accompanies your display.

All product documentation is available to download from the Raymarine website: www.raymarine.com/manuals.

5.2 Troubleshooting

The troubleshooting information provides possible causes and corrective action required for common problems associated with installation and operation of your product.

Before packing and shipping, all Raymarine products are subjected to comprehensive testing and quality assurance programs. If you do experience problems with your product this section will help you to diagnose and correct problems in order to restore normal operation.

If after referring to this section you are still having problems with your product, please refer to the Technical support section of this manual for useful links and Raymarine Product Support contact details.

Sonar troubleshooting

Scrolling image is not being displayed

Possible causes	Possible solutions
Sonar disabled	Enable **Ping** from the Sonar app's sounder tab: **Menu** > **Settings** > **Sounder** > **Ping**.
Incorrect transducer selected	Check that the correct transducer is selected in the Sonar app's Transducer tab: **Menu** > **Settings** > **Transducer** > **Ping**.
Damaged cables	1. Check that the transducer cable connector is fully inserted and locked in position. 2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary. 3. With the unit turned on, try flexing the cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary. 4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer. After cleaning or replacement coat the transducer using a water-based anti-fouling paint.
Wrong transducer fitted	Check product and transducer documentation and ensure that the transducer is compatible with your system.
External sonar module: SeaTalkhs / RayNet network problem.	• Check that the unit is correctly connected to the Display or network switch. Check all connections ensuring connections are secure, clean and free from corrosion, replace if necessary.
External sonar module: Software mismatch between equipment may prevent communication.	Ensure all Raymarine products contain the latest available software, check the Raymarine website: www.raymarine.com/software for software compatibility.

No depth reading / lost bottom lock

Possible causes	Possible solutions
Transducer location	Check that the transducer has been installed in accordance with the instructions provided with the transducer.
Transducer angle	If the transducer angle is too great the beam can miss the bottom, adjust transducer angle and recheck.
Transducer kicked-up	If the transducer has a kick-up mechanism, check that it has not kicked up due to hitting an object.

Possible causes	Possible solutions
Power source insufficient	With the product under load, using a multi-meter, check the power supply voltage as close to the unit as possible to establish actual voltage when the current is flowing. (Check your product's Technical specification for power supply requirements.)
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer. After cleaning or replacement coat the transducer using a water-based anti-fouling paint.
Damaged cables	1. Check the unit's connector for broken or bent pins. 2. Check that the cable connector is fully inserted into the unit and that the locking collar is in the locked position. 3. Check the cable and connectors for signs of damage or corrosion, replace if necessary. 4. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary. 5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 6. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.
Vessel speed too high	Slow vessel speed and recheck.
Bottom too shallow or too deep	The bottom depth may be outside of the transducers depth range, move vessel to shallower or deeper waters as relevant and recheck.

Poor / problematic image

Possible causes	Possible solutions
Targets will appear differently if your vessel is stationary (e.g.: fish will appear on the display as straight lines).	Increase vessel speed.
Scrolling paused or speed set too low	Unpause or increase sonar scrolling speed.
Sensitivity settings may be inappropriate for present conditions.	Check and adjust sensitivity settings or perform a Sonar reset.
Damaged cables	1. Check the unit's connector for broken or bent pins. 2. Check that the cable connector is fully inserted into the unit and that the locking collar is in the locked position. 3. Check the cable and connectors for signs of damage or corrosion, replace if necessary. 4. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary. 5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 6. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this

Possible causes	Possible solutions
	can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.
Transducer location	• Check that the transducer has been installed in accordance with the instructions provided with the transducer. • If a transom mount transducer is mounted too high on the transom it may be lifting out of the water, check that the transducer face is fully submerged when planing and turning.
Transducer kicked-up	If the transducer has a kick-up mechanism, check that it has not kicked up due to hitting an object.
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer. After cleaning or replacement coat the transducer using a water-based anti-fouling paint.
Damaged transducer cable	Check that the transducer cable and connection is free from damage and that the connections are secure and free from corrosion.
Turbulence around the transducer at higher speeds may affect transducer performance	Slow vessel speed and recheck.
Interference from another transducer	1. Turn off the transducer causing the interference. 2. Reposition the transducers so they are farther apart.
Unit power supply fault	Check the voltage from the power supply, if this is too low it can affect the transmitting power of the unit.

Resetting the sonar

You can reset the display's internal sonar module to its factory default settings following the steps below.

In the Fishfinder app:

1. Select **Menu**.
2. Select **Settings**.
3. Select **Sounder**.
4. Select **Reset sounder**.
5. Select **Yes** to confirm or **No** to abort the operation, as appropriate.

The internal sonar module will now be reset to factory default settings.

Chapter 6: Maintenance

Chapter contents

6.1 Routine checks

The following periodic checks should be made:

- Examine cables for signs of damage, such as chafing, cuts or nicks.
- Check that the cable connectors are firmly attached and that their locking mechanisms are properly engaged.

Note: Cable checks should be carried out with the power supply switched off.

Warning: High voltage

This product contains high voltage. Adjustments require specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts or adjustments. The operator should never remove the cover or attempt to service the product.

6.2 Transducer cleaning

You must clean your transducer regularly to remove organic growth. Organic growth can build up quickly on the bottom face of your transducer; this can impact transducer performance in a matter of weeks.

Important:

- When cleaning growth from an anti-fouled transducer, take care not to let paint dust and other debris enter the water, as this can have an impact on aquatic life.
- Take care not to scratch the surface of the transducer as this can impact transducer performance.
- Do NOT use harsh cleaning solvents such as acetone as this will damage the transducer.

Follow the guidance below to clean growth from your transducer:

- use a soft cloth and a mild household cleaning detergent to clean mild growth build up.
- use a scouring pad, such as a green Scotch Brite™ pad and a mild household cleaning detergent to clean moderate growth build up.
- you may need to use a fine grade wet and dry paper and a mild household cleaning detergent to clean severe build up.

6.3 Re-applying anti-fouling paint

If you have applied anti-fouling paint to your transducer, it is important to re-apply it at least every 6 months, to maintain effectiveness.

Follow the instructions below to re-apply anti-fouling paint.

Important:

- Following environmental best practice, preparation and re-application of the anti-fouling paint should be performed using suitable washdown facilities, which ensures paint particles do not enter the water and impact aquatic life.
- Take care not to scratch the transducer face, as this may impact transducer performance.

1. Remove your vessel from the water.
2. Clean your transducer, ensuring all organic growth is removed.
3. Remove any flaking anti-foul paint.
4. Use a soft dry cloth to remove any loose bits of paint.
5. Re-apply a water-based anti-fouling paint.

Chapter 7: Technical support

Chapter contents

7.1 Raymarine product support and servicing

Raymarine provides a comprehensive product support service, as well as warranty, service, and repairs. You can access these services through the Raymarine website, telephone, and e-mail.

Product information

If you need to request service or support, please have the following information to hand:

- Product name.
- Product identity.
- Serial number.
- Software application version.
- System diagrams.

You can obtain this product information using diagnostic pages of the connected MFD.

Servicing and warranty

Raymarine offers dedicated service departments for warranty, service, and repairs.

Don't forget to visit the Raymarine website to register your product for extended warranty benefits: http://www.raymarine.co.uk/display/?id=788.

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	• E-Mail: emea.service@raymarine.com • Tel: +44 (0)1329 246 932
United States (US)	• E-Mail: rm-usrepair@flir.com • Tel: +1 (603) 324 7900

Web support

Please visit the "Support" area of the Raymarine website for:

- **Manuals and Documents** — http://www.raymarine.com/manuals
- **FAQ / Knowledgebase** — http://www.raymarine.com/knowledgebase
- **Technical support forum** — http://forum.raymarine.com
- **Software updates** — http://www.raymarine.com/software

Worldwide support

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	• E-Mail: support.uk@raymarine.com • Tel: +44 (0)1329 246 777
United States (US)	• E-Mail: support@raymarine.com • Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)
Australia and New Zealand (Raymarine subsidiary)	• E-Mail: aus.support@raymarine.com • Tel: +61 2 8977 0300
France (Raymarine subsidiary)	• E-Mail: support.fr@raymarine.com • Tel: +33 (0)1 46 49 72 30
Germany (Raymarine subsidiary)	• E-Mail: support.de@raymarine.com • Tel: +49 (0)40 237 808 0
Italy (Raymarine subsidiary)	• E-Mail: support.it@raymarine.com • Tel: +39 02 9945 1001
Spain (Authorized Raymarine distributor)	• E-Mail: sat@azimut.es • Tel: +34 96 2965 102
Netherlands (Raymarine subsidiary)	• E-Mail: support.nl@raymarine.com • Tel: +31 (0)26 3614 905

Region	Contact
Sweden (Raymarine subsidiary)	• E-Mail: support.se@raymarine.com • Tel: +46 (0)317 633 670
Finland (Raymarine subsidiary)	• E-Mail: support.fi@raymarine.com • Tel: +358 (0)207 619 937
Norway (Raymarine subsidiary)	• E-Mail: support.no@raymarine.com • Tel: +47 692 64 600
Denmark (Raymarine subsidiary)	• E-Mail: support.dk@raymarine.com • Tel: +45 437 164 64
Russia (Authorized Raymarine distributor)	• E-Mail: info@mikstmarine.ru • Tel: +7 495 788 0508

7.2 Learning resources

Raymarine has produced a range of learning resources to help you get the most out of your products.

Video tutorials

YouTube	Raymarine official channel on YouTube: • http://www.youtube.com/user/RaymarineInc LightHouse™ 3 tips and tricks: • http://www.raymarine.com/multifunction-displays/light-house3/tips-and-tricks
	Video Gallery: • http://www.raymarine.co.uk/view/?id=2679

Note:

- Viewing the videos requires a device with an Internet connection.
- Some videos are only available in English.

Training courses

Raymarine regularly runs a range of in-depth training courses to help you make the most of your products. Visit the Training section of the Raymarine website for more information:

- http://www.raymarine.co.uk/view/?id=2372

FAQs and Knowledge Base

Raymarine has produced an extensive set of FAQs and a Knowledge Base to help you find more information and troubleshoot any issues.

- http://www.raymarine.co.uk/knowledgebase/

Technical support forum

You can use the Technical support forum to ask a technical question about a Raymarine product or to find out how other customers are using their Raymarine equipment. The resource is regularly updated with contributions from Raymarine customers and staff:

- http://forum.raymarine.com

Chapter 8: Technical specification

Chapter contents

8.1 Technical specification

Physical specification

Overall dimensions (including fairing):	• Length: 267.01 mm (10.51 in) • Height: 170.36 mm (6.71 in) including cable bend radius • Width: 63.60 mm (2.50 in)
Cable length:	• HV-300TH: 6 m (19.69 ft) fitted cable • HV-300THP-P / HV-300THP-S 2 m (6.5 ft)
Weight (unboxed):	1.52 kg (3.35 lb) Maximum

Environmental specification

Operating temperature	–2°C (28.4°F) to + 55°C (131°F)
Storage temperature	–20°C (23°F) to + 70°C (158°F)
Waterproof rating	• IPx6 (surfaces exterior to hull, only) • IPx7 • IPx8

HyperVision™ technical specification

The following specification only applies to HyperVision™ products.

Frequencies	• 1.2 MHz CHIRP • 350 kHz CHIRP • 200 kHz CHIRP
Channels	• Conical CHIRP sonar • RealVision™ 3D (Hyper) • RealVision™ 3D (Standard) • SideVision™ (Hyper) • SideVision™ (Standard) • DownVision™ (Hyper) • DownVision™ (Standard)
200 kHz range	• Conical CHIRP sonar = 0.6 M (2 ft) to 274 m (900 ft)
350 kHz range	• RealVision™ 3D = 0.6 M (2 ft) to 91 m (300 ft) • SideVision™ = 0.6 M (2 ft) to 91 m (300 ft) each side • DownVision™ = 0.6 M (2 ft) to 183 m (600 ft)
1.2 MHz range	• RealVision™ 3D = 0.6 M (2 ft) to 38 m (125 ft) • SideVision™ = 0.6 M (2 ft) to 38 m (125 ft) each side • DownVision™ = 0.6 M (2 ft) to 38 m (125 ft)

Conformance specification

Conformance	• EN 60945:2002 • IEC 28846:1993 • EMC Directive 2014/30/EU • Australia and New Zealand: C-Tick, Compliance Level 2

Chapter 9: Spares and accessories

Chapter contents

9.1 Spares

Description	Part number
HV-300THP-P Thru-hull plastic transducer	R70725
HV-300THP-S Thru-hull plastic transducer	R70726
HV-300TH / HV-300THP-P / HV-300THP-S fairing block	R70741

9.2 Accessories

Description	Part number
HyperVision™ transducer extension cable 4 m (13.12 ft)	A80562
HV-300THP-P / HV-300THP-S ‘Y’ splitter cable 0.3 m (0.98 ft)	A80605

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