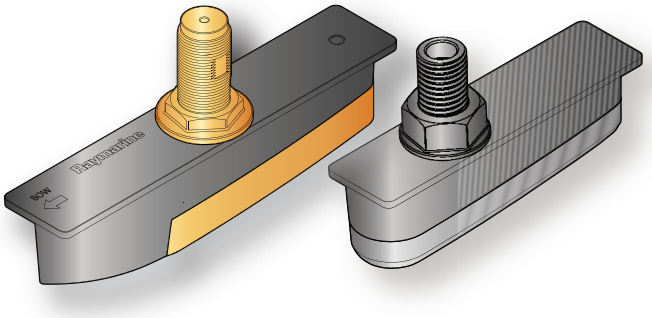
DownVision™ Thru-Hull Transducers CPT-70 / CPT-80 / CPT-110 / CPT-120



Installation instructions

English
Date: 05-2015
Document number: 87201-2-EN

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Raymarine®

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Software updates

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

Product handbooks

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

ENGLISH
Document number: 87201-2
Date: 05-2015

Contents

Chapter 1: Important information

Certified Installation

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: 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.

Warning: Corrosion

To prevent corrosion, NEVER install a transducer with a bronze housing on a vessel with a metal hull.

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: Positive ground systems

Do not connect this unit to a system which has positive grounding.

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: Power supply protection

When installing this product ensure the power source is adequately protected by means of a suitably-rated fuse or automatic circuit breaker.

Caution: Do not cut transducer cables

- Cutting the transducer cable severely reduces sonar performance. If the cable is cut, it must be replaced, it cannot be repaired.
- Cutting the transducer cable will void the warranty and invalidate the European CE mark.

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.

Transducer cleaning

Growth can collect on the bottom of the transducer, this can reduce performance. To prevent the build up of sea growth, coat the transducer with a thin layer of water based antifouling paint, available from your local marine dealer. Reapply paint every 6 months or at the beginning of each boating season. Certain smart transducers have restrictions on where antifouling paint is applied. Please consult your dealer.

Note: Transducers with a temperature sensor may not work properly if painted.

Note: Never use ketone based paint. Ketones can attack many plastics possibly damaging the sensor.

Note: Never use spray paint on your transducer. Spraying incorporates tiny air bubbles, and a marine transducer cannot transmit properly through air.

Use a soft cloth and mild household detergent to clean the transducer. If the fouling is severe, remove the growth with a green scotch brite™ pad. Be careful to avoid scratching the transducers face.

If your transducer has a paddlewheel you can wet sand with fine grade wet/dry paper.

Note: Harsh cleaning solvents such as acetone may damage the transducer.

Water ingress

Water ingress disclaimer

The waterproof rating capacity of this product meets the stated IPX standard referred to in the product's *Technical Specification*.

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

Raymarine UK Ltd. declares that this product is compliant with the essential requirements of EMC directive 2004/108/EC.

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

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.

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 Document information

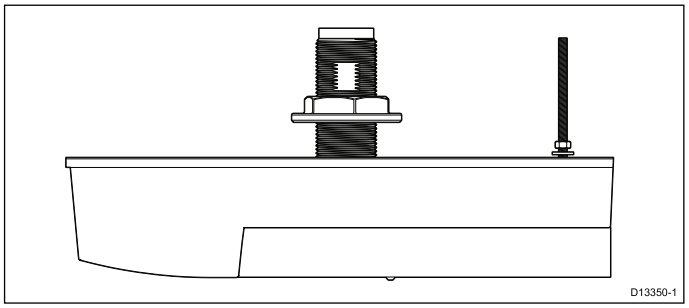
This document contains important information related to the installation of your Raymarine product.

The document includes information to help you:

- plan your installation and ensure you have all the necessary equipment;
- install and connect your product as part of a wider system of connected marine electronics;
- troubleshoot problems and obtain technical support if required.

This and other Raymarine product documents are available to download in PDF format from www.raymarine.com.

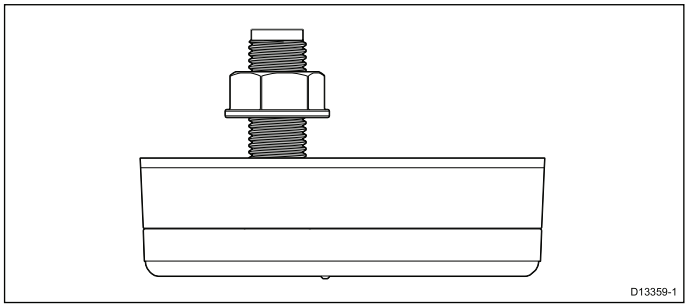
DownVision™ thru-hull bronze transducers



Part number	Description	Mounting Type	Construc-tion
A80279	CPT-80 Dragonfly DownVision transducer	Thru-hull	Bronze
A80271	CPT-120 DownVision transducer	Thru-hull	Bronze

- **CPT-80 and CPT-120** — bronze transducers are recommended for fiberglass and wooden hulls and should not be used on a metal hull.

DownVision™ thru-hull plastic transducers



Part number	Description	Mounting Type	Construc-tion
A80278	CPT-70 Dragonfly DownVision transducer	Thru-hull	Plastic
A80277	CPT-110 DownVision transducer	Thru-hull	Plastic

- **CPT-70 and CPT-110** — plastic transducers are recommended for fiberglass and metal hulls and should not be used on a wooden hull.

Document illustrations

Your product 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.

Product documentation

The following documentation is applicable to your product:

Description	Part number
DownVision™ Thru-Hull transducer Installation instructions Installation of a CPT–70 / CPT–80 / CPT–110 / CPT–120 transducer.	87201
LightHouse™ MFD operation instructions Details the operation of the fishfinder application (including DownVision operation) for **LightHouse™** powered MFDs.	81360
Dragonfly® 6 and 7 Installation and operation instructions Details the operation of the Sonar and DownVision applications for **Dragonfly®** products.	81345
Dragonfly® 4, 5 and Wi–Fish Installation and operation instructions Details the operation of the Sonar and DownVision applications for **Dragonfly®** products.	81358

Operation instructions

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

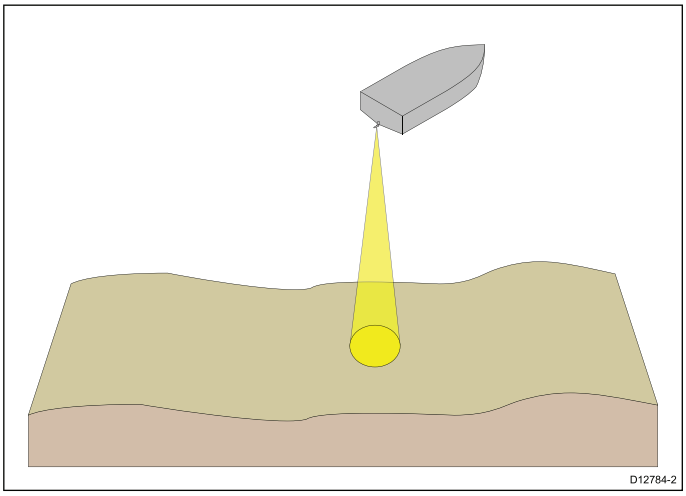
Sonar module installation instructions

This document includes installation instructions for the transducer only. For installation instructions for connecting a sonar module, please refer to the documentation that accompanies the sonar module.

2.2 CHIRP Sonar overview

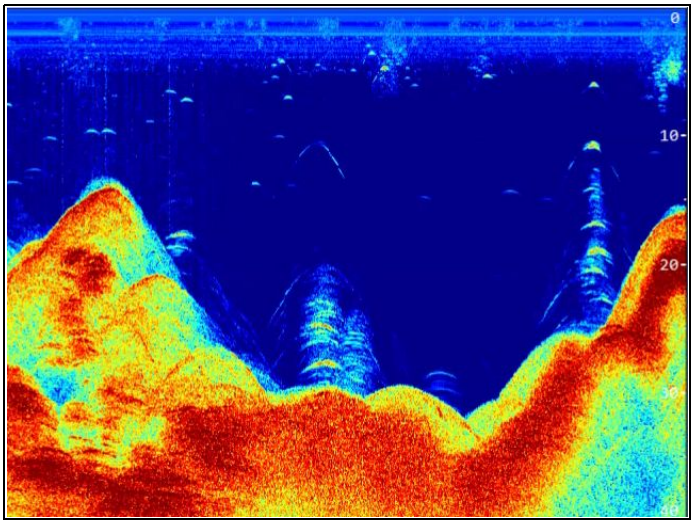
CHIRP sonar produces a conical shaped beam, the coverage of the conical beam is the water column directly beneath the vessel

Conical beam



Sonar is effective at a range of speeds. In deeper waters the CHIRP bandwidth is automatically optimized to improve bottom lock and the detection of moving objects (e.g. fish) in the wider water column.

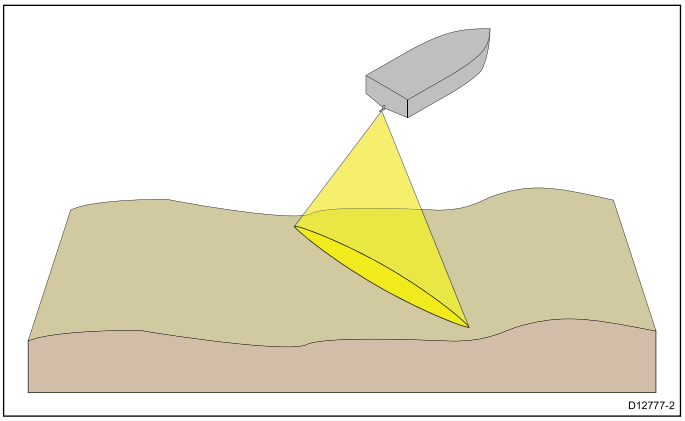
CHIRP sonar screen example



2.3 CHIRP DownVision™ overview

DownVision™ produces a wide–angle side-to-side beam and a thin fore-to-aft beam. The coverage of the **DownVision™** beam is a water column directly beneath and to the sides of the vessel.

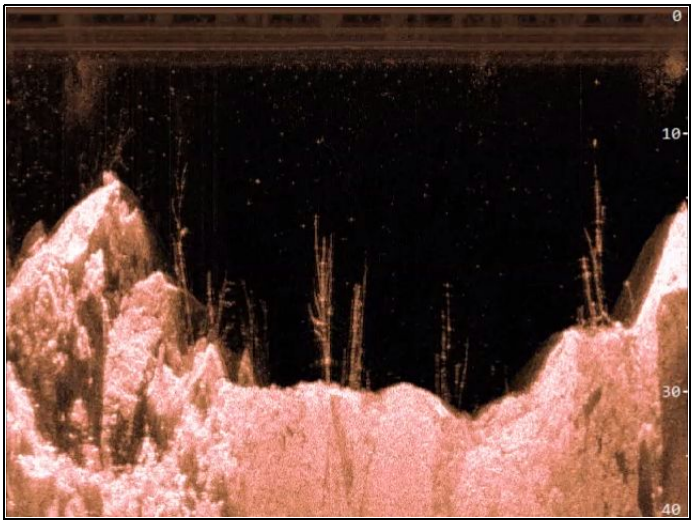
DownVision™ beam



DownVision™ is effective at lower vessel speeds. In deeper waters the CHIRP bandwidth is automatically optimized to improve bottom lock and the detection of moving objects (e.g. fish) in the wider water column.

The wide, thin beam produces clear target returns. The use of CHIRP processing and a higher operating frequency provide a more detailed image, making it easier to identify bottom structures around which fish may reside.

CHIRP DownVision™ screen example



Chapter 3: Planning the installation

Chapter contents

3.1 Installation checklist

Installation includes the following activities:

	Installation Task
1	Plan your system.
2	Obtain all required equipment and tools.
3	Site all equipment.
4	Route all cables.
5	Drill cable and mounting holes.
6	Make all connections into equipment.
7	Secure all equipment in place.
8	Power on and test the system.

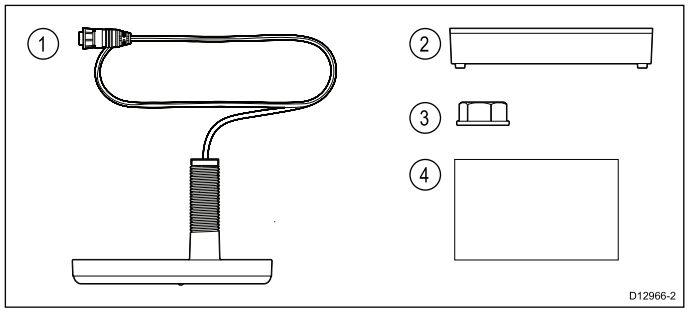
Schematic diagram

A schematic diagram is an essential part of planning any installation. It is also useful for any future additions or maintenance of the system. The diagram should include:

- Location of all components.
- Connectors, cable types, routes and lengths.

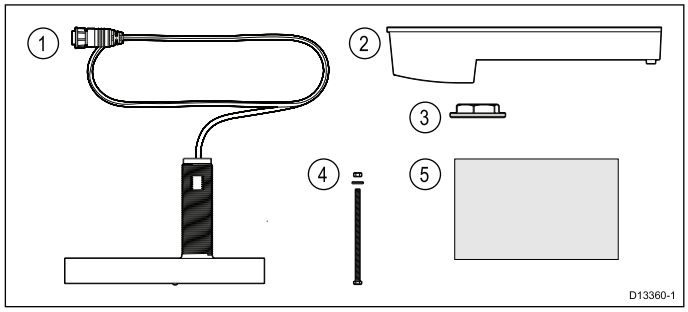
3.2 Parts supplied

Parts supplied — CPT-70 / CPT-110



1	Thru-hull plastic transducer
2	Dead rise block
3	Plastic securing nut
4	Documentation

Parts supplied — CPT-80 / CPT-120



1	Thru-hull bronze transducer
2	Fairing block
3	Bronze securing nut
4	Anti-rotation bolt, washer and nut
5	Documentation

3.3 Required additional components

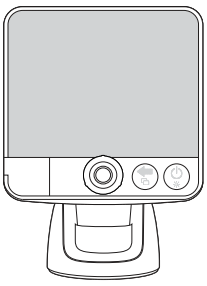
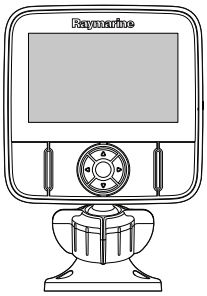
This product forms part of a system of electronics and requires the following additional components for full operation.

- Compatible DownVision™ Sonar Module or DownVision™ variant multifunction display. Refer to 3.4 Compatible **DownVision™** products, for a list of compatible products.
- Transducer extension cables. Refer to Chapter 4 Cables and connections, for suitable cables.

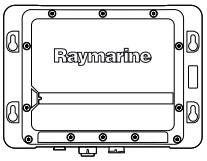
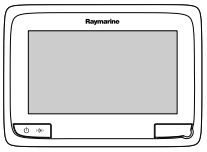
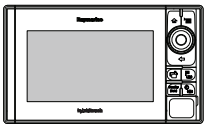
3.4 Compatible DownVision™ products

The transducer can be connected directly to the following **DownVision™** sonar modules and displays.

CPT-60 / CPT-70 / CPT-80

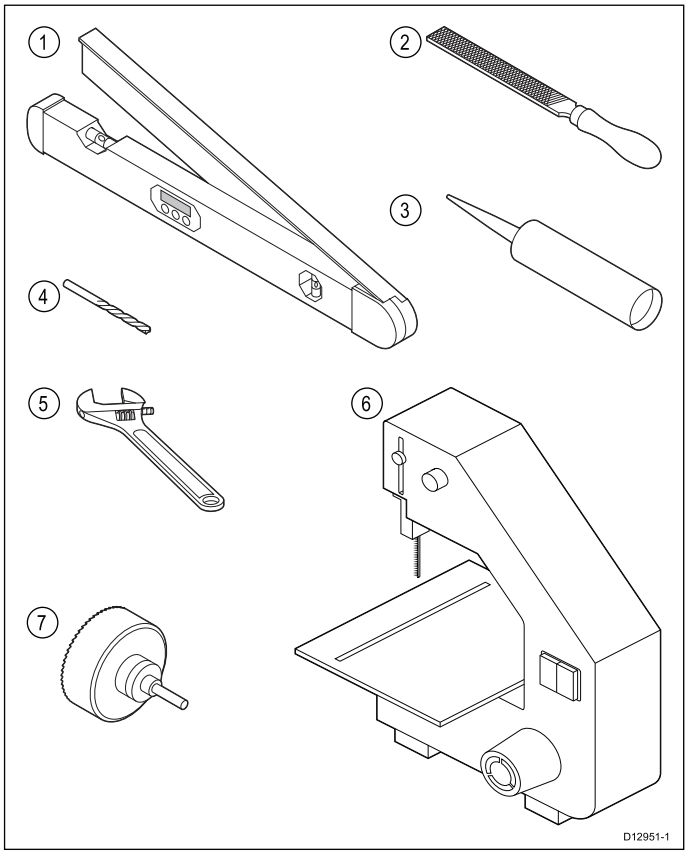
	Description	Part number
	**Dragonfly®** 6	E70226
	Dragonfly® 7	E70230
	**Dragonfly®** 4 DVS	E70292
	Dragonfly® 4 Pro	E70294
	Dragonfly® 5 DVS	E70306
	Dragonfly® 5 Pro	E70293

CPT-100 / CPT-110 / CPT-120

	Description	Part number
	**CP100**	E70204
	**a68** / **a68 Wi-Fi**	E70206 / E70207
	a78 / **a78 Wi-Fi**	E70208 / E70209
	a98	E70234
	a128	E70237
	**eS78**	E70265
	eS98	E70275
	eS128	E70285

3.5 Tools required

The following tools are required to install the transducer.



1	Angle finder
2	File
3	*Marine grade adhesive sealant (suitable for submerged applications)
4	Drill bit (for drilling the pilot hole)
5	Adjustable spanner (suitable size for the transducer nut)
6	Band saw (for cutting the Dead rise block)
7	32 mm (1 1/4 in) hole cutter

Important:

*It is the installers responsibility to ensure correct installation. Before installing the transducer please check the sealant manufacturer's guidelines to ensure it is suitable for use in the intended environment and with the materials used in the transducer and your vessel's hull.

Raymarine accepts no liability for damage caused due to the use of unsuitable materials.

3.6 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.

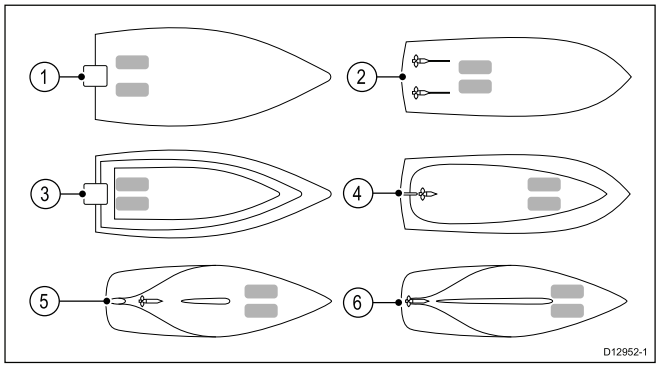
3.7 Location requirements

The guidelines below should be followed when selecting a location for your transducer.

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

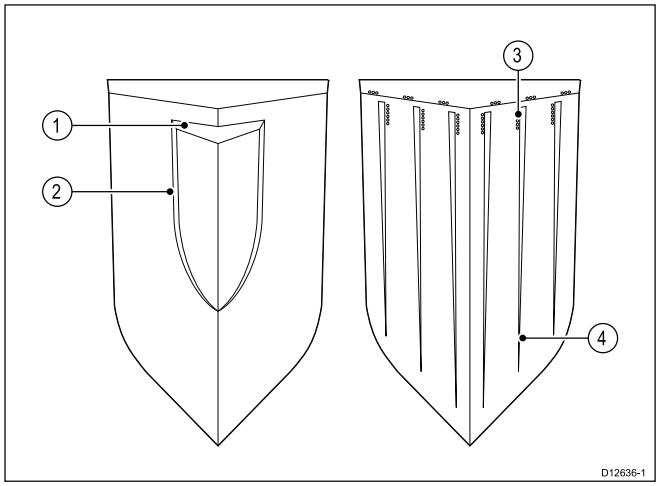
Important: Do NOT install the transducer in-line with trailer rollers, your vessel's engine intake or discharge openings.

- The transducer should be installed as close to the centerline 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	Displace-ment 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

- The transducer should be installed away from any protrusions such as transducers, steps, ribs, strakes, or rows of rivets.



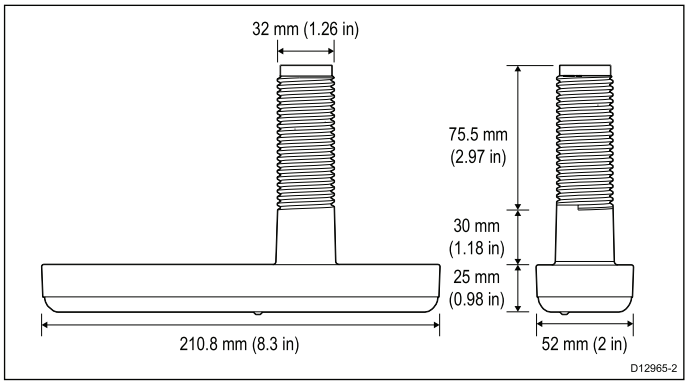
1	Step
2	Rib
3	Row of rivets
4	Strake

- The transducer must be installed in the correct orientation, as identified on the deadrise / fairing block.
- The transducer 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.
- The transducer should be installed so that the bottom face of the transducer is pointing straight down.

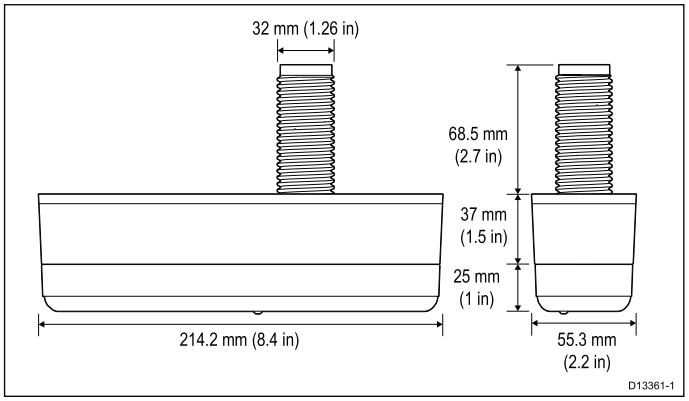
3.8 Product dimensions

CPT-70 / CPT-110 plastic transducer dimensions

Transducer only

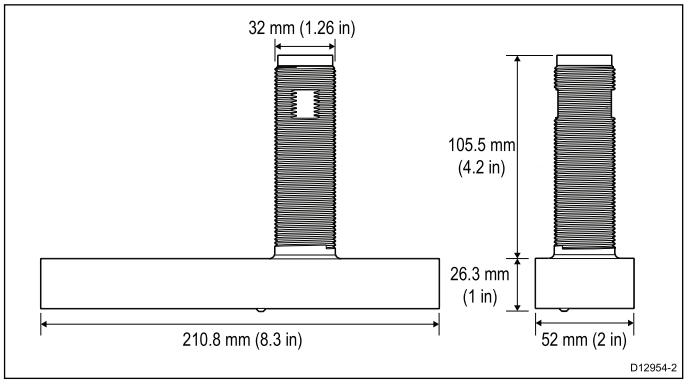


Transducer with dead rise block

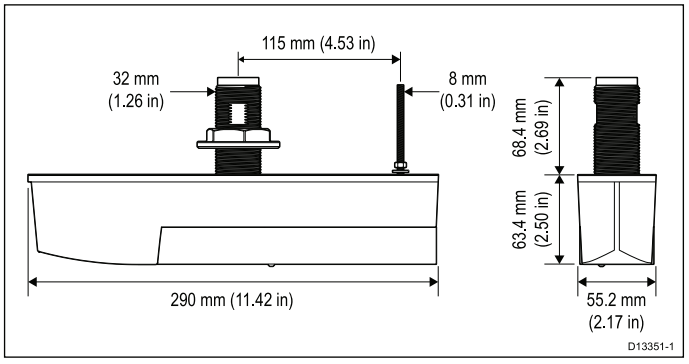


CPT-80 / CPT-120 bronze transducer dimensions

Transducer only



Transducer with fairing block



Chapter 4: Cables and connections

Chapter contents

4.1 General cabling guidance

Cable types and length

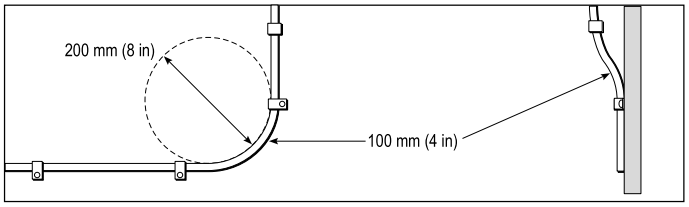
It is important to use cables of the appropriate type and length

- Unless otherwise stated use only standard cables of the correct type, supplied by Raymarine.
- Ensure that any non-Raymarine cables are of the correct quality and gauge. For example, longer power cable runs may require larger wire gauges to minimize voltage drop along the run.

Routing cables

Cables must be routed correctly, to maximize performance and prolong cable life.

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter of 200 mm (8 in) / minimum bend radius of 100 mm (4 in).



- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through.
- Do NOT run cables near to engines or fluorescent lights.

Always route data cables as far away as possible from:

- other equipment and cables,
- high current carrying ac and dc power lines,
- antennae.

Strain relief

Ensure adequate strain relief is provided. Protect connectors from strain and ensure they will not pull out under extreme sea conditions.

Cable shielding

Ensure that all data cables are properly shielded that the cable shielding is intact (e.g. hasn't been scraped off by being squeezed through a tight area).

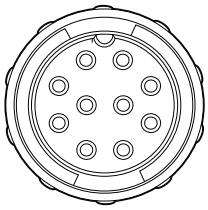
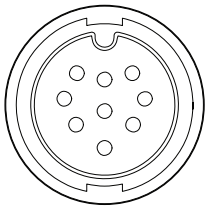
4.2 Cable routing

Cable routing requirements for the transducer cable.

- Check that the cable is long enough to reach the equipment that it will be connected to. Refer to the manual that accompanied your sonar module for details of transducer extension cables.
- Use grommets in any pass through holes to prevent damage to the transducer cable.
- To prevent interference, separate the transducer cable from any other electrical cables.
- Secure the cable at regular intervals using cable clips (not supplied).
- Any excess cable should be coiled up at a convenient location.

4.3 Connections overview

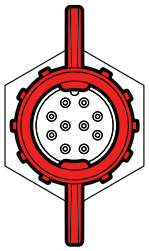
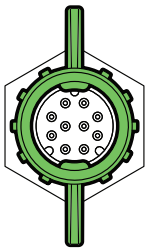
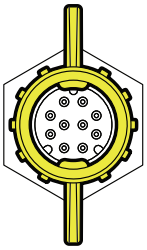
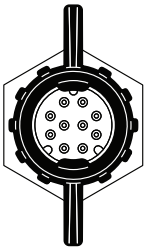
Use the following information to help you identify the connections on your product.

Connector	Connector type	Connects to:
	CPT-60 / CPT-70 / CPT–80 Transducer and display power	Dragonfly display
	CPT-100 / CPT-110 / CPT-120 Transducer	Sonar module or compatible multifunction display.

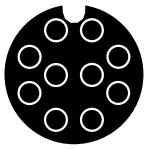
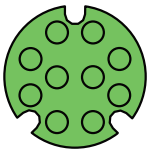
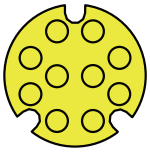
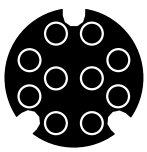
Connections overview

Dragonfly-4 / **Dragonfly-5**, **Wi-Fish™** products and the **CPT-DV** and **CPT-DVS** include connectors with a 3 keyway guide. Depending on date of manufacture **Dragonfly-6**, **Dragonfly-7** products and **CPT-60**/ **CPT-70** / **CPT-80** transducers are available with 1 keyway guide (Legacy) or 3 keyway guide (Updated). Adaptor cables can be used to connect 1 keyway connectors to 3 keyway connectors.

Rear connector / Locking collar

Connector	Description	Unit / Display	Compatible transducer
	Red – 1 keyway	• Legacy **Dragon-fly-6** • Legacy **Dragon-fly-7**	• Legacy **CPT-60** • Legacy **CPT-70** • Legacy **CPT-80**
	Green – 3 keyway	• **DVS** • **Pro** • Updated **Dragon-fly-6** • Updated **Dragon-fly-7**	• **CPT-DVS** • Updated **CPT-60** • Updated **CPT-70** • Updated **CPT-80**
	Yellow – 3 keyway	• **DV** • **Wi-Fish™**	• **CPT-DV**
	Black – 3 keyway	• **5 M**	• N/A – **5 M** power connector

Transducer cable connectors

Cable Connector	Description	Transducer	Compatible unit / display
	Black – 1 keyway	• Legacy **CPT-60** • Legacy **CPT-70** • Legacy **CPT-80**	• Legacy **Dragon-fly-6** • Legacy **Dragon-fly-7**
	Green – 3 keyway	• **CPT-DVS** • Updated **CPT-60** • Updated **CPT-70** • Updated **CPT-80**	• **DVS** • **Pro** • Updated **Dragon-fly-6** • Updated **Dragon-fly-7**
	Yellow – 3 keyway	• **CPT-DV**	• **DV** • **Wi-Fish™**
	Black – 3 keyway	• N/A – **5 M** power connector	• **5 M**

Adaptor cables

Adaptor cables are available to enable connection of the older 1 keyway connectors to the new 3 keyway connectors.

Adaptor cable	Compatible transducer	Compatible display / unit
A80331 — **CPT-DV** / **CPT-DVS** (3 keyway) to Legacy **Dragonfly-6** / **Dragonfly-7** (1 keyway) adaptor cable	• **CPT-DVS** • **CPT-DV** • Updated **CPT-60** • Updated **CPT-70** • Updated **CPT-80**	• Legacy **Dragonfly-6** • Legacy **Dragonfly-7**
A80332 — Legacy (1 keyway) **CPT-60** / **CPT-70**/ **CPT-80** transducer to**Dragonfly-4** / **Dragonfly-5** and **Wi-Fish™** (3 keyway) adaptor cable	• Legacy **CPT-60** • Legacy **CPT-70** • Legacy **CPT-80**	• **DV** • **DVS** • **Pro** • **Wi-Fish™** • Updated **Dragonfly-6** • Updated **Dragonfly-7**

Legacy and updated products

Current **Dragonfly-6**, **Dragonfly-7** displays and **CPT-60 / CPT-70 / CPT-80** transducer designs have been modified to include the improved 3 keyway connectors.

The table below identifies the effective manufacturing date for the improved keyway connectors.

Product	3 keyway introduction date	3 keyway introduction serial number
Dragonfly-6 display	January 2015	E70085 0150001
Dragonfly-7 display	November 2014	E70231 1140712
CPT-60	December 2014	A80195 1240023
CPT-70	TBC	TBC
CPT-80	TBC	TBC

4.4 Transducer cable connection

Follow the *Cables and Connections* section of the manual that accompanied your sonar module / display to make the appropriate connections.

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.

Transducer cable extension

For some installations it may be necessary to extend the transducer cable.

- Refer to Chapter 12 Spares and accessories for a list of suitable transducer extension cables.
- Raymarine recommends a maximum of one cable extension for any single transducer cable.
- For best performance, keep all cable lengths to a minimum.

Chapter 5: Pre-installation test

Chapter contents

5.1 Testing the transducer

Transducer operation should be checked before installation.

1. Connect the transducer to the sonar module's / display's transducer connection.
2. Fully submerge the transducer in water.
3. Power up the sonar module / display.
4. Open a Fishfinder application on your display.
5. Check that accurate depth and temperature readings are displayed.
6. If you experience difficulties obtaining readings then contact Raymarine Technical Support.

Warning: Transducer operation

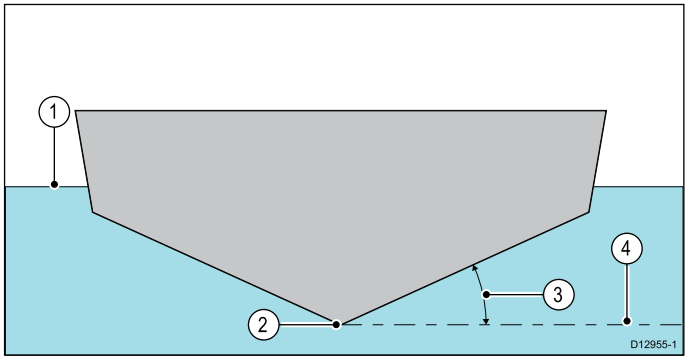
Only test and operate the transducer in the water. Do NOT operate out of water as overheating may occur.

Chapter 6: Mounting — CPT-70 / CPT-110

Chapter contents

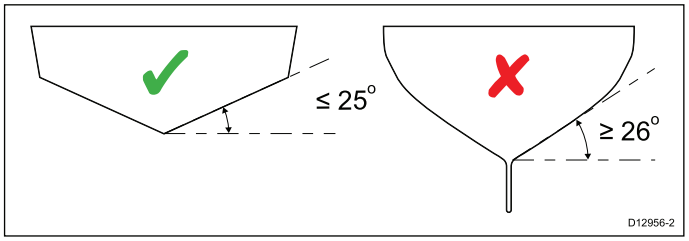
6.1 Dead rise angle

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

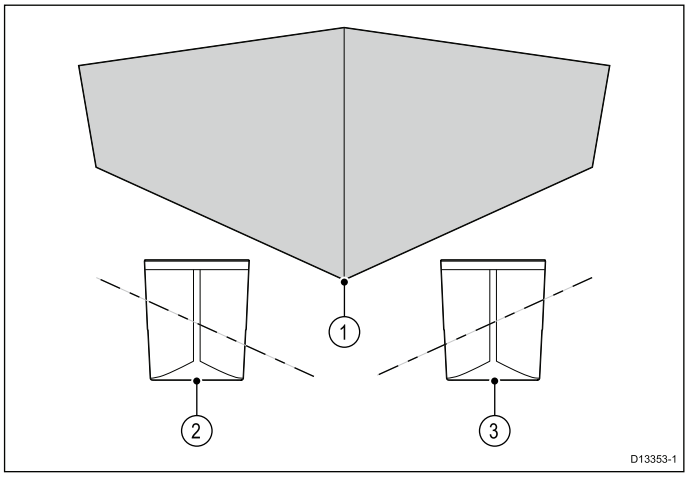


Cutting the dead rise / fairing block

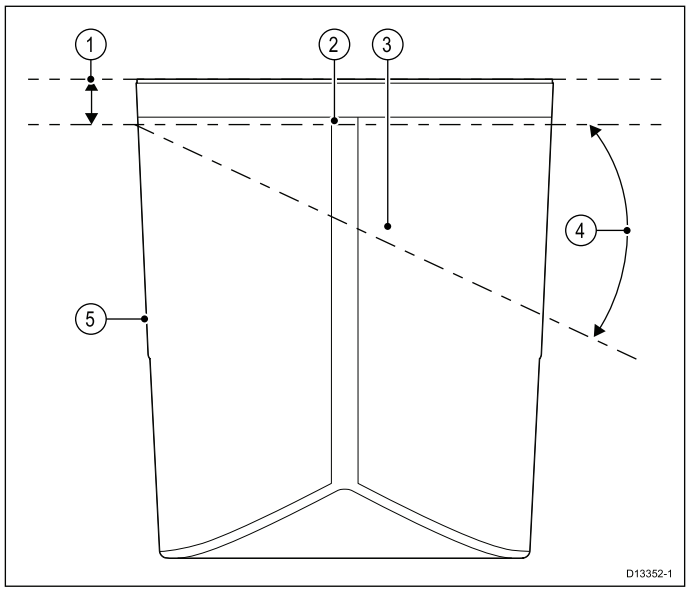
The block must be cut to the shape of the hull.

Note: The illustrations below depict the fairing block supplied with the **CPT-80** and **CPT-120**, however cutting and orientation requirements for the **CPT-70** and **CPT-110** are the same.

The orientation of the cut depends on whether the installation is port or starboard side.



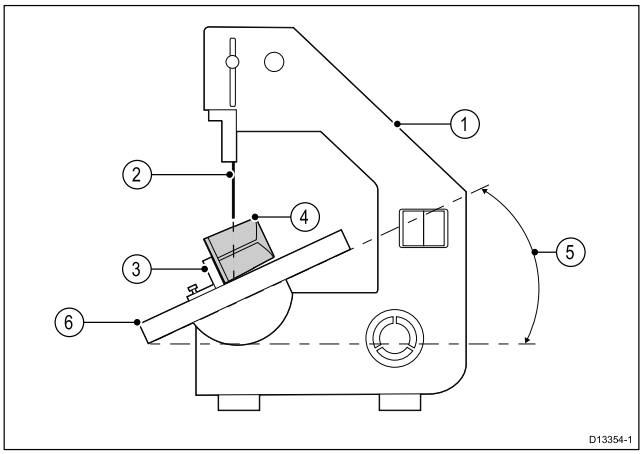
1. Vessel bow (viewed from front)
2. Cut for starboard side installation
3. Cut for port side installation



1	Fence to blade distance
2	Parallel to waterline
3	Example slope of hull
4	Dead rise angle 0° to 25°
5	Front of block facing forward

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 the distance specified in the *fence to blade* table.
4. Position the block against the fence so that the top face of the block sits against the fence.
5. Recheck steps 1 to 4.
6. Cut the block.



1	Band saw
2	Blade
3	Fence (cutting guide)
4	Dead rise / fairing block
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 nut against.

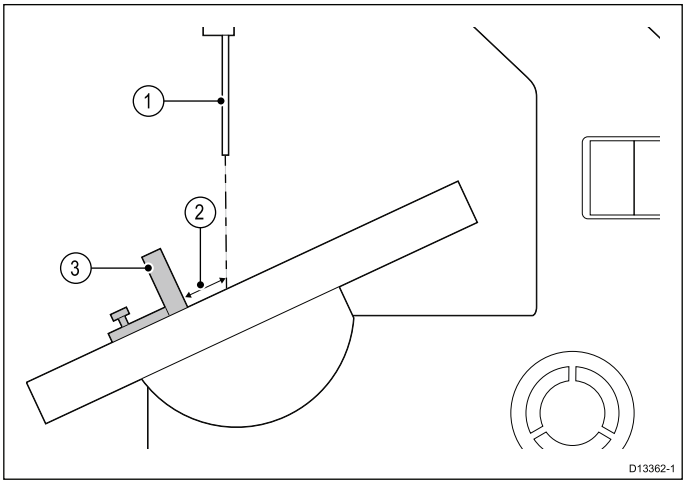
7. Check the bottom half of the block against the hull to ensure a good fit.

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

8. 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 your dead rise angle.

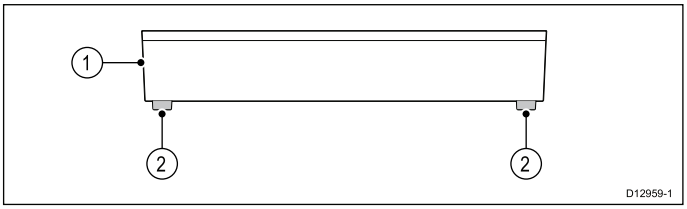


1. Blade
2. Fence to blade distance
3. Fence

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

Removing dead rise block locators

When installing the plastic transducer on a vessel with no dead rise you must remove the locators from the bottom of the dead rise block.



1	Dead rise block
2	locators (for locating on the transducer)

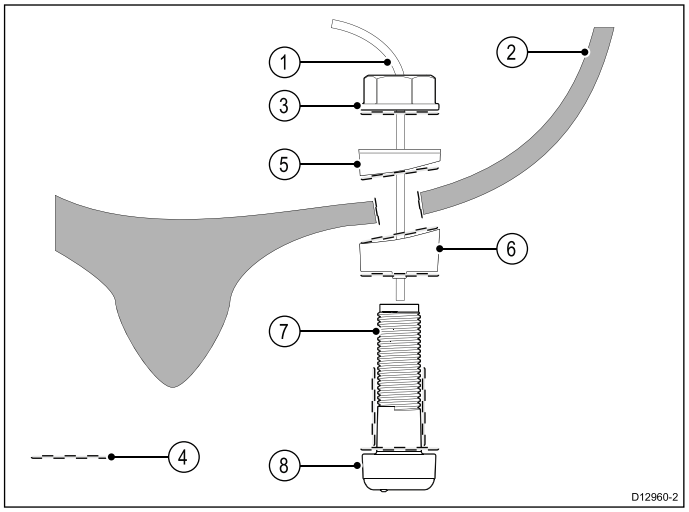
1. Remove the dead rise block from the transducer.
2. Using a suitable saw, cut the locators from the bottom of the block.

The block is now ready to be used inside the hull as described in the *Mounting the transducer in a hull without a dead rise* section.

6.2 Mounting the transducer in a hull with a dead rise

When mounting the transducer in a hull that has a dead rise angle the transducer should be mounted following the steps below.

Important: Do NOT remove the label attached to the transducer cable as it contains important information.



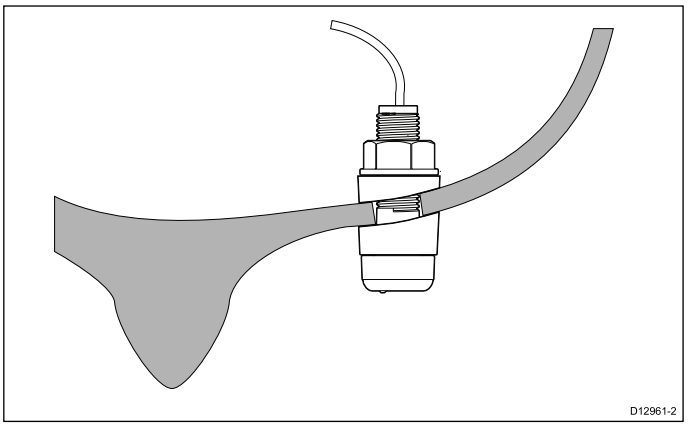
1	Transducer cable
2	Vessel hull
3	Nut
4	Marine grade adhesive sealant — suitable for submerged applications (not supplied)
5	Top half of Dead rise block
6	Bottom half of Dead rise block
7	Threaded Tube
8	Transducer

1. Align the bottom half of the Dead rise block so that it is parallel to the centerline (keel) of the vessel.
2. Using a permanent marker, draw around the outside edge of the block and the internal hole for the threaded tube.
3. Remove the block from the hull.
4. Drill a pilot hole in the center of the location marked out on the hull for the threaded tube.
5. Drill the hole out using a suitable size hole cutter.
6. Using sandpaper and / or a file ensure there are no rough edges or burrs.
7. Ensure all surfaces are clean and free from debris.
8. Apply a thick bead of marine grade adhesive sealant all around the edge of the top face of the transducer and the bottom face of the Dead rise block.
9. Apply a thick bead of marine grade adhesive sealant up each side of the threaded tube, ensuring that the sealant will protrude approximately 6 mm above the final tightened nut.
10. Feed the transducer cable through the dead rise block's threaded tube hole.
11. Push the dead rise block down onto the transducer ensuring that the locators on the block line up with the locator holes on the transducer.
12. Apply a thick bead of marine grade adhesive sealant all around the edge of the top face of the bottom half of the cut dead rise block, where it will meet the hull.
13. Apply a thick bead of marine grade adhesive sealant all around the edges of the hole in the hull.
14. Guide the transducer cable and threaded tube up through the vessel hull and ensure the transducer is lined up with the markings made in step 2.
15. Apply a thick bead of marine grade adhesive sealant all around the edge of the bottom face of the top half of the cut dead rise block, where it will meet the hull.
16. With a person inside the vessel, place the top half of the dead rise block over the threaded tube.
17. Apply a thick bead of marine grade adhesive sealant all around the edge of the top face of the top half of the cut dead rise block, where it will meet the nut.
18. Apply a thick bead of marine grade adhesive sealant to the bottom of the nut.
19. Ensuring that the dead rise block and transducer do not move, secure the transducer assembly by tightening the nut.
20. Hand tighten the nut and add a further quarter turn using an adjustable 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.

    Do NOT overtighten. Overtightening can cause damage to the transducer and hull which may result in water leaking into the hull.
21. Remove any excess adhesive sealant.
22. Ensure that the sealant has fully cured before putting the vessel back in the water.

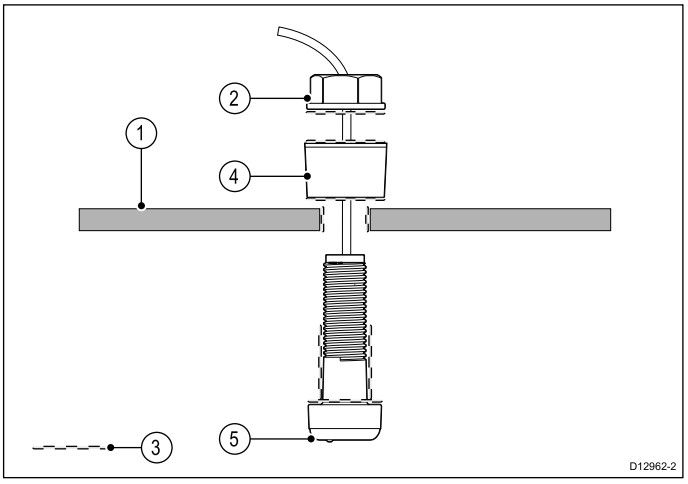
    Refer to the sealant manufacturers instructions for curing times.
23. Once the vessel has been put back in the water check for leaks immediately.
24. Check for leaks at regular intervals after installation until you are satisfied that there are no leaks.
25. Ensure checking for leaks around the transducer is added to your routine vessel maintenance schedule.



6.3 Mounting the transducer in a hull without a dead rise

When mounting the transducer in a hull with a flat bottom (no dead rise) follow the steps below.

Important: Do NOT remove the label attached to the transducer cable as it contains important information.



1	Hull
2	Nut
3	Marine grade adhesive sealant — suitable for submerged applications (not supplied)
4	Dead rise block — The dead rise block or suitable spacer should be used between the nut and the hull
5	transducer

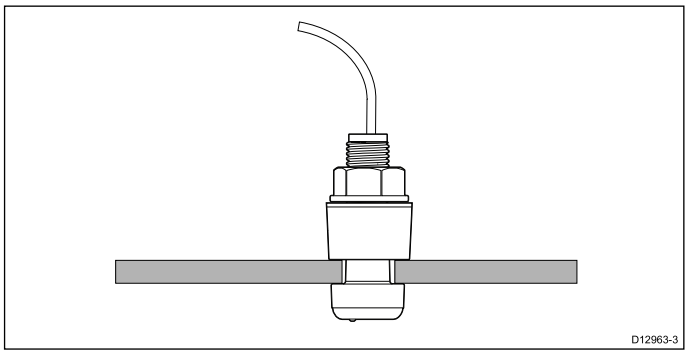
1. Ensure an appropriate location for the transducer has been selected following the guidelines provide.
2. Drill a pilot hole in the center of the selected location for the threaded tube.
3. Drill the hole out using a suitable size hole cutter.
4. Using sandpaper and / or a file ensure there are no rough edges or burrs.
5. Ensure all surfaces are clean and free from debris.
6. Apply a thick bead of marine grade adhesive sealant all around the top face of the transducer, where it will meet the hull.
7. Apply a thick bead of marine grade adhesive sealant up each side of the threaded tube, ensuring that the sealant will protrude approximately 6 mm above the final tightened nut.
8. Apply a thick bead of marine grade adhesive sealant all around the edges of the hole in the hull.
9. Guide the transducer cable and threaded tube up through the vessel's hull and ensure the transducer is parallel with the centerline.
10. Apply a thick bead of marine grade adhesive sealant all around the top and bottom faces of the dead rise block.
11. With a person inside the vessel, place the dead rise block over the threaded tube.

12. Apply a thick bead of marine grade sealant to the bottom of the nut.
13. Ensuring that the dead rise block and transducer do not move, secure the transducer assembly by tightening the nut.
14. Hand tighten the nut and add a further quarter turn using an adjustable 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.

    Do NOT overtighten. Overtightening can cause damage to the transducer and hull which may result in water leaking into the hull.
15. Remove any excess adhesive sealant.
16. Ensure that the sealant has fully cured before putting the vessel back in the water.

    Refer to the sealant manufacturers instructions for curing times.
17. Once the vessel has been put back in the water check for leaks immediately.
18. Check for leaks at regular intervals after installation until you are satisfied that there are no leaks.
19. Ensure checking for leaks around the transducer is added to your routine vessel maintenance schedule.



Caution: Transducer cable

- 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.

6.4 Cored fiberglass hull mounting

If installing in a cored fiberglass hull, it is recommended that the transducer is mounted in a non-cored section.

If installation in a cored section of the hull is required then the area around the hole must be adequately strengthened to ensure it is not damaged when tightening the transducer.

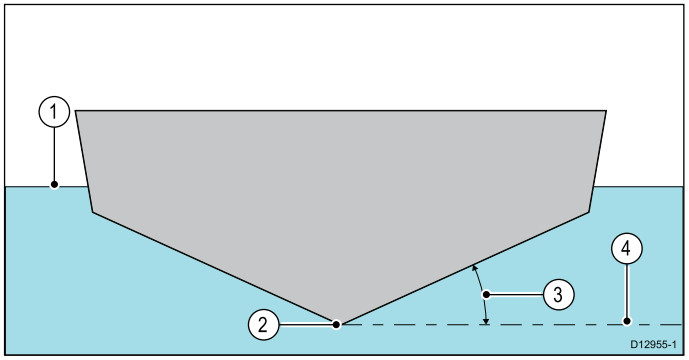
Important: Installation in a cored fiberglass hull should only be carried out by a competent marine installer.

Chapter 7: Mounting — CPT-80 / CPT-120

Chapter contents

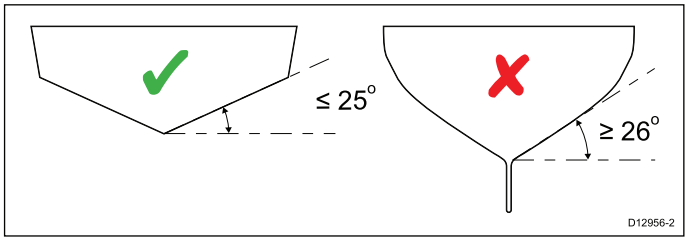
7.1 Dead rise angle

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

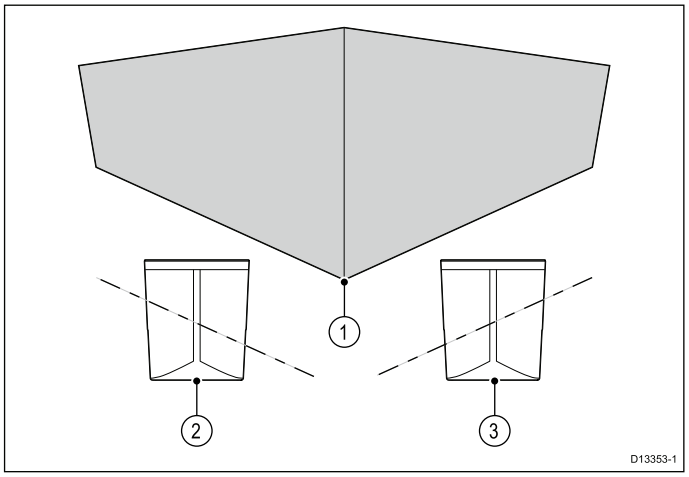


Cutting the dead rise / fairing block

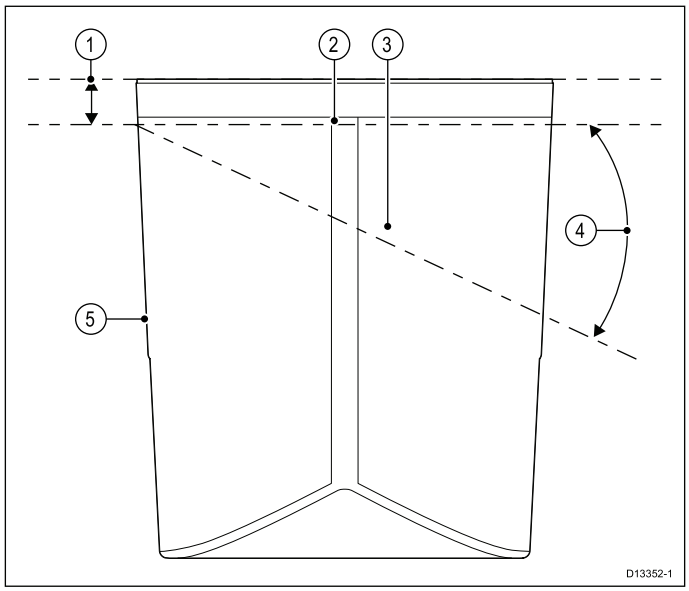
The block must be cut to the shape of the hull.

Note: The illustrations below depict the fairing block supplied with the **CPT-80** and **CPT-120**, however cutting and orientation requirements for the **CPT-70** and **CPT-110** are the same.

The orientation of the cut depends on whether the installation is port or starboard side.



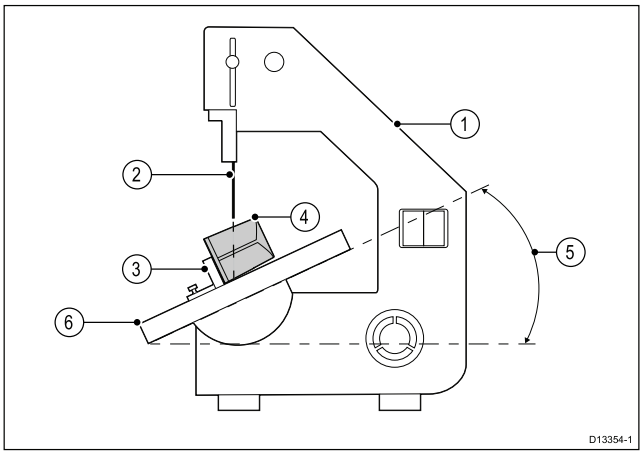
1. Vessel bow (viewed from front)
2. Cut for starboard side installation
3. Cut for port side installation



1	Fence to blade distance
2	Parallel to waterline
3	Example slope of hull
4	Dead rise angle 0° to 25°
5	Front of block facing forward

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 the distance specified in the *fence to blade* table.
4. Position the block against the fence so that the top face of the block sits against the fence.
5. Recheck steps 1 to 4.
6. Cut the block.



1	Band saw
2	Blade
3	Fence (cutting guide)
4	Dead rise / fairing block
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 nut against.

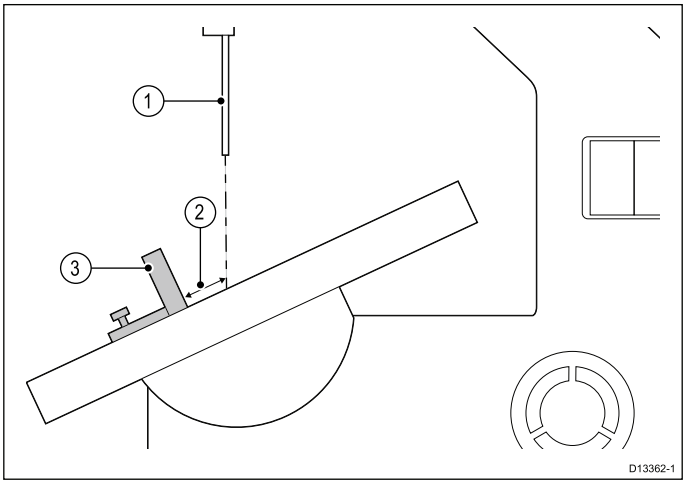
7. Check the bottom half of the block against the hull to ensure a good fit.

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

8. 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 your dead rise angle.

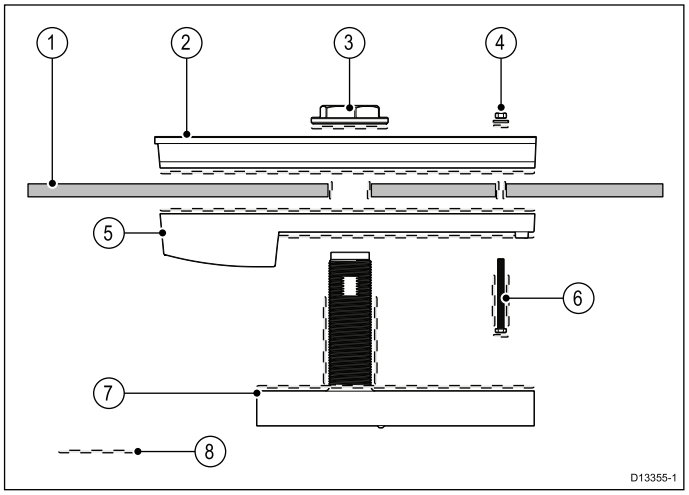


1. Blade
2. Fence to blade distance
3. Fence

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

7.2 Mounting the transducer

Important: Do NOT remove the label attached to the transducer cable as it contains important information.



1	Vessel hull
2	Top half of fairing block
3	Nut
4	Nut and washer (for anti-rotation bolt)
5	Bottom half of fairing block
6	Anti-rotation bolt
7	Transducer
8	Marine grade adhesive sealant — suitable for submerged applications (not supplied)

1. Ensure an appropriate location for the transducer has been selected, following the guidelines provided.
2. Align the bottom half of the fairing block so that it is parallel to the centerline (keel) of the vessel.
3. Using a permanent marker, draw around the outside edge of the block and the internal hole for the threaded tube and anti-rotation bolt.
4. Remove the block from the hull.
5. Drill a pilot hole in the center of the location marked out on the hull for the threaded tube.
6. Drill the hole out using a suitable size hole cutter.
7. Drill a suitable sized hole for the anti-rotation bolt.
8. Using sandpaper and / or a file ensure there are no rough edges or burrs.
9. Ensure all surfaces are clean and free from debris.
10. Apply a thick bead of marine grade adhesive sealant all around the edge of the top face of the transducer and the bottom face of the block that will meet the transducer.
11. Apply a thick bead of marine grade adhesive sealant up each side of the threaded tube and anti-rotation bolt, ensuring that the sealant will protrude approximately 6 mm above the final tightened nuts.
12. Apply a thick bead of marine grade adhesive sealant to the head of the anti-rotation bolt where it will meet the top face of the transducer.
13. Insert the anti-rotation bolt into the anti-rotation hole so that the hexagonal bolt head sits in the captive recess located in the bottom of the block.
14. Feed the transducer cable through the bottom half of the fairing block's threaded tube hole.
15. Push the block down onto the transducer, ensuring that the locators on the block line up with the locator holes on the transducer.
16. Apply a thick bead of marine grade adhesive sealant all around the edge of the top face of the bottom half of the block, where it will meet the hull.
17. Apply a thick bead of marine grade adhesive sealant all around the edges of the holes in the hull.
18. Guide the transducer cable, threaded tube and anti-rotation bolt up through the vessel hull and ensure the transducer is lined up with the markings made in step 2.
19. Apply a thick bead of marine grade adhesive sealant all around the edge of the bottom face of the top half of the block, where it will meet the hull.
20. With a person inside the vessel, place the top half of the block over the threaded tube and anti-rotation bolt.
21. Place the washer over the anti-rotation bolt.
22. Apply a thick bead of marine grade adhesive sealant to the bottom edge of the nuts.
23. Ensuring that the block and transducer do not move, secure the transducer assembly by tightening the nuts using an adjustable wrench (spanner).

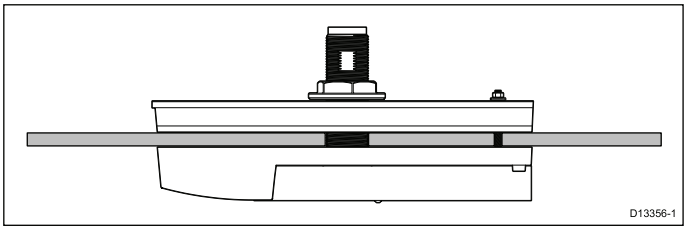
Note: Wooden hull — Allow the wooden hull to swell prior to tightening the nut using the adjustable spanner.

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 all applied surfaces.

Do NOT overtighten. Overtightening can cause damage to the transducer and hull which may result in water leaking into the hull.

24. Remove any excess adhesive sealant.
25. Ensure that the sealant has fully cured before putting the vessel back in the water.

    Refer to the sealant manufacturers instructions for curing times.
26. Once the vessel has been put back in the water check for leaks immediately.
27. Check for leaks at regular intervals after installation until you are satisfied that there are no leaks.
28. Ensure checking for leaks around the transducer is added to your vessel's routine maintenance schedule.



Caution: Transducer cable

- 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.

7.3 Cored fiberglass hull mounting

If installing in a cored fiberglass hull, it is recommended that the transducer is mounted in a non-cored section.

If installation in a cored section of the hull is required then the area around the hole must be adequately strengthened to ensure it is not damaged when tightening the transducer.

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

Chapter 8: Troubleshooting

Chapter contents

8.1 Troubleshooting

The troubleshooting information provides possible causes and corrective action required for common problems associated with marine electronics installations.

All Raymarine products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programs. However, if you experience problems with the operation of 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 unit, please contact Raymarine Technical Support for further advice.

Sonar troubleshooting

Problems with the sonar and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Sonar data not available on multifunction display.	Unit power supply fault.	Check the unit power supply and cables.
	Other unit fault.	Refer to the instructions supplied with the unit.
	SeaTalk^{hs} / RayNet network problem.	Check that the unit is correctly connected to a Raymarine network switch. If a crossover coupler or other coupler cable / adapter is used, check all connections (as applicable).
		Check the status of the Raymarine network switch (if applicable).
		Check that SeaTalk^{hs}/ RayNet cables are free from damage.
	Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.
Problematic data readings. **Note:** Not all transducers and / or sonar modules support the detection of depth, range and temperature. For more information, refer to the latest specifications and documentation available for your particular products on the Raymarine website (www.raymarine.com).	Gain or Frequency settings may be inappropriate for present conditions.	Check the sonar presets, gain and frequency settings.
	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.
	Unit cable fault.	Ensure that the power, transducer and all other cables to the unit are properly connected and free from damage.
	Transducer fault.	Check that the transducer is mounted correctly and is clean.
		If you have a transom mount transducer, check that the transducer hasn't kicked-up due to hitting an object.
	Other unit fault.	Refer to the instructions supplied with the unit.
	Vessel stationary.	Fish arches are not displayed if the vessel is stationary; fish will appear on the display as straight lines.
	High vessel speed	Turbulence around the transducer may be confusing the unit.
	Scroll speed set to zero	Adjust the scroll speed.

Resetting the sonar module

You can use the reset function on a compatible Raymarine multifunction display to restore the sonar module to its factory default settings.

In the fishfinder application:

1. Select **Menu**.
2. Select **Set-up**.
3. Select **Sounder Set-up**.
4. Select **Sonar Reset**.
5. Select **Yes** to confirm or **No** to abort the operation, as appropriate.

The unit will now be reset to factory default settings.

Chapter 9: Maintenance

Chapter contents

9.1 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.

9.2 Unit cleaning instructions

The unit does not require regular cleaning. However, if you find it necessary to clean the unit, please follow the steps below:

1. Ensure power is switched off.
2. Wipe unit clean with a damp cloth.
3. If necessary, use a mild detergent solution to remove grease marks.

Transducer care and cleaning

Growth can collect on the bottom of the transducer, this can reduce performance. To prevent the build-up of sea growth, coat the transducer with a thin layer of water-based antifouling paint, available from your local marine dealer. Reapply paint every 6 months or at the beginning of each boating season. Certain smart transducers have restrictions on where antifouling paint is applied. Please consult your dealer.

Note: Transducers with a temperature sensor may not work properly if painted.

Note: Never use ketone-based paint. Ketones can attack many plastics, possibly damaging the sensor.

Note: Never use spray paint on your transducer. Spraying incorporates tiny air bubbles, and a marine transducer cannot transmit properly through air.

Use a soft cloth and mild household detergent to clean the transducer. If the fouling is severe, remove the growth with a tough cleaning pad, such as a green Scotch Brite™ pad for example. Be careful to avoid scratching the face of the transducer.

Note: Harsh cleaning solvents such as acetone WILL damage the transducer.

Chapter 10: Technical support

Chapter contents

10.1 Raymarine customer support

Raymarine provides a comprehensive customer support service. You can contact customer support through the Raymarine website, telephone and e-mail. If you are unable to resolve a problem, please use any of these facilities to obtain additional help.

Web support

Please visit the customer support area of our website at:

www.raymarine.com

This contains Frequently Asked Questions, servicing information, e-mail access to the Raymarine Technical Support Department and details of worldwide Raymarine agents.

Telephone and e-mail support

In the USA:

- **Tel:** +1 603 324 7900
- **Toll Free:** +1 800 539 5539
- **E-mail:** support@raymarine.com

In the UK, Europe, and the Middle East:

- **Tel:** +44 (0)13 2924 6777
- **E-mail:** ukproduct.support@raymarine.com

In Southeast Asia and Australia:

- **Tel:** +61 (0)29479 4800
- **E-mail:** aus.support@raymarine.com

Product information

If you need to request service, 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 the menus within your product.

10.2 Viewing product information

You can view information about your unit from the **Diagnostics** menu on a compatible multifunction display. This option displays information such as product serial number and software version.

With the Homescreen displayed:

1. Select **Set-up.**
2. Select **Maintenance**.
3. Select **Diagnostics**.
4. Select the **Select Device** option.
   A list of connected devices is displayed.
5. Select the product for which you want to view information. Alternatively, select **Show All Data** to display information for all connected products.

Chapter 11: Technical specification

Chapter contents

11.1 Technical specification

Physical specification

Dimensions	• Length: 210.8 mm (8.3 in) • Height: 131.8 mm (5.2 in) Max
Cable length	10 m (32.8 ft)

Transducer environmental specification

Operating temperature	0 ºC to + 40 ºC (32 ºF to 104 ºF)
Storage temperature	–20 ºC to + 70 ºC (23 ºF to 158 ºF)
Waterproof rating	• IPX6 and IPX7

Sonar / DownVision™ specification

The following specification only applies to **DownVision™** products.

Channels	2 x **CHIRP** (1 x traditional sonar and 1 x **DownVision™**)
Beam coverage	• **Sonar — conical** beam. • **DownVision™** — Wide (port / starboard) and thin (fore / aft) **fan** beam.
Depth range	0.6 M (2 ft) to 183 m (600 ft). Depending on water conditions, the Sonar channel maybe able to achieve increased depth range over the **DownVision™** channel.

Note: The **DV** and **Wi-Fish™** variants are single channel **DownVision™** only products.

Conformance specification

Conformance	• EN 60945:2002 • IEC 28846:1993 • EMC Directive 2004/108/EC • Australia and New Zealand: C-Tick, Compliance Level 2

Chapter 12: Spares and accessories

Chapter contents

12.1 Spares and accessories

Spares

Description	Part number
Dead Rise (fairing) block (**CPT-70** / **CPT-110**)	R70258
Fairing block (**CPT-80** / **CPT-120**)	A80329
Replacement Bronze securing nut (**CPT-80** / **CPT-120**)	R70260
Replacement Plastic securing nut (**CPT-70** / **CPT-110**)	R70259

Accessories

Description	Part number
4 m (13.1 ft.) Transducer extension cable (**CPT-110** / **CPT-120**)	A80273
4 m (13.1 ft.) Dragonfly transducer extension cable (**CPT-70** / **CPT-80**)	A80224
3 keyway transducer to Legacy 1 keyway display adaptor cable	A80331
Legacy 1 keyway transducer to 3 keyway display adaptor cable	A80332

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