



Raymarine®

RVM-400 / RVM-412 / RVM-420

Installation Instructions

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CONTENTS

CHAPTER 1 IMPORTANT INFORMATION	7		
Safety warnings.....	7		
Product warnings.....	7		
Regulatory notices.....	8		
Declaration of Conformity.....	8		
Disclaimer.....	8		
Warranty policy and registration.....	9		
Product disposal.....	9		
IMO and SOLAS.....	9		
Technical accuracy.....	9		
Publication copyright.....	9		
CHAPTER 2 DOCUMENT INFORMATION	10		
2.1 Applicable products.....	11		
2.2 Document information.....	11		
2.3 Product documentation.....	11		
Document illustrations.....	11		
Operation instructions.....	11		
CHAPTER 3 PRODUCT AND SYSTEM OVERVIEW	12		
3.1 Product overview.....	13		
RealVision Max 3D overview.....	14		
Sonar range.....	14		
Compatible sonar modules and displays.....	14		
Transducer cable length.....	14		
RealVision transducer extension cables.....	15		
CHAPTER 4 PARTS SUPPLIED	16		
4.1 Parts supplied — RVM-400-Series transducers.....	17		
4.2 Additional parts supplied.....	17		
CHAPTER 5 PRODUCT DIMENSIONS	18		
5.1 Transducer dimensions — RVM-4xx.....	19		
RealVision transducer cable connector dimensions.....	19		
CHAPTER 6 LOCATION REQUIREMENTS	21		
6.1 Warnings and cautions.....	22		
6.2 Location requirements.....	22		
Cored fiberglass hull mounting.....	23		
6.3 EMC installation guidelines.....	24		
CHAPTER 7 INSTALLATION	25		
7.1 Tools required.....	26		
7.2 Testing the transducer.....	26		
7.3 Transducer mounting.....	27		
Drilling holes in the hull.....	27		
Assembling the external components.....	28		
Assembling the internal components.....	29		
Finalizing the installation.....	30		
Anti-fouling.....	30		
CHAPTER 8 CABLES AND CONNECTIONS — GENERAL INFORMATION	31		
8.1 General cabling guidance.....	32		
Cable types and length.....	32		
Strain relief.....	32		
Cable shielding.....	32		

CHAPTER 9 CONNECTIONS	33	Sonar range	49
9.1 Cable routing	34	13.4 Conformance specification.....	50
9.2 Attaching the connector locking collar	34	CHAPTER 14 SPARES AND ACCESSORIES.....	51
9.3 RVM-400 connection	35	14.1 Spares	52
9.4 RVM-412 / RVM-420 connection.....	35	14.2 Accessories.....	52
9.5 Transducer cable length.....	35	APPENDIX A DOCUMENT CHANGE	
9.6 RealVision transducer extension cables	36	HISTORY	53
9.7 Maximum transducer cable length	36		
9.8 Making connections	36		
CHAPTER 10 SYSTEM CHECKS AND			
TROUBLESHOOTING	37		
10.1 RealVision™ AHRS calibration	38		
10.2 Troubleshooting	38		
Operation instructions	38		
Sonar troubleshooting.....	39		
Resetting the sonar module.....	41		
CHAPTER 11 MAINTENANCE	42		
11.1 Routine checks	43		
11.2 Transducer cleaning	43		
11.3 Bridging material removal	43		
11.4 Re-applying anti-fouling paint.....	43		
CHAPTER 12 TECHNICAL SUPPORT	45		
12.1 Raymarine technical support and servicing	46		
12.2 Learning resources	47		
CHAPTER 13 TECHNICAL SPECIFICATION	48		
13.1 Physical specification	49		
13.2 Environmental specification	49		
13.3 RealVision Max 3D sonar specification	49		

CHAPTER 1: IMPORTANT INFORMATION

Safety warnings



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 or damage to your vessel. It may also cause poor product performance or invalidate the product warranty.
- Raymarine highly recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Register your warranty on the Raymarine website: www.bit.ly/rym-warranty



Warning: High voltage

This product contains high voltage. Do NOT remove covers or attempt to access internal components, unless specifically instructed in the documentation provided.



Warning: Switch off power supply

Ensure that 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 to do so in this document.



Warning: Transducer cables

Do NOT remove the transducer cable whilst the product is powered on; doing so could cause sparks. If the transducer cable is accidentally removed whilst the product is powered on, switch the product's power off, replace the cable, and then switch the power back on.



Warning: Sonar operation

- NEVER touch the transducer face when the sonar is powered on.
- SWITCH OFF the sonar if divers are likely to be within 7.6 m (25 ft) of the transducer.

Product warnings



Warning: Maximum transducer cable length

The maximum length of cable between the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module (including the transducer's captive cable) must NOT exceed 18 m (59 ft). Transducer cable lengths greater than this may cause damage to the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module.



Warning: Positive ground systems

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



Warning: Transducer operation

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

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.



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: Petrochemicals

Prolonged exposure to petrochemicals such as gasoline and diesel oil etc. may cause the transducer to discolor and degrade.



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 ketone or copper-based anti-fouling paint.

Regulatory notices

Declaration of Conformity

Declaration of Conformity for product sold into EU member state regions.

Raymarine UK Ltd declares that the products listed below are in conformity with the relevant sections of the listed designated standards and / or other normative documents:

- RVM-400 RealVision™ Max 3D Stainless steel thru-hull transducer, part number A80704

- RVM-412P (Port) RealVision Max 3D Stainless steel thru-hull transducer, part number A80705
- RVM-412S (Starboard) RealVision Max 3D Stainless steel thru-hull transducer, part number A80706
- RVM-420P (Port) RealVision Max 3D Stainless steel thru-hull transducer, part number A80707
- RVM-420S (Starboard) RealVision Max 3D Stainless steel thru-hull transducer, part number A80708

Region	Standard	Mark
UK	EMC Regulations 2016	
EU	Recreational Craft Directive 2013/53/EU	

The original Declaration of Conformity certificate may be viewed at: www.bit.ly/rvm400-docs

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.

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Warranty policy and registration

Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online: www.bit.ly/rym-warranty

It is important that you register your product to receive full warranty benefits. Your product package includes a barcode label indicating the serial number of the unit. This serial number is also provided on a label affixed to the product itself. You will need this serial number when registering your product online.

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: <https://bit.ly/rym-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.

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CHAPTER 2: DOCUMENT INFORMATION

CHAPTER CONTENTS

- [2.1 Applicable products — page 11](#)
- [2.2 Document information — page 11](#)
- [2.3 Product documentation — page 11](#)

2.1 Applicable products

This document is applicable to the following products:

- **RVM-400** all-in-one RealVision® Max 3D Stainless steel thru-hull transducer, part number A80704
- **RVM-412** split pair 12° RealVision® Max 3D Stainless steel thru-hull transducers, part number T70543
- **RVM-420** split pair 20° RealVision® Max 3D Stainless steel thru-hull transducers, part number T70544

2.2 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.bit.ly/rym-docs

2.3 Product documentation

The following documentation is applicable to your product:

Applicable documents

- **87437** — RVM-400-Series Thru-Hull Transducer Installation Instructions (This document).
- **87447** — RVM-400-Series Thru-Hull Transducer Mounting Template.
- **81406** — LightHouse 4 Advanced Operation Instructions (includes transducer calibration and operation instructions for the Sonar / Fishfinder app on your MFD / chartplotter).

This and other product documents are available from the Raymarine website: www.bit.ly/rym-docs

Related documents

- **87436** — RVM1600 RealVision Max 3D Sonar Module Installation Instructions.

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.

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.bit.ly/rym-docs

CHAPTER 3: PRODUCT AND SYSTEM OVERVIEW

CHAPTER CONTENTS

- [3.1 Product overview — page 13](#)

3.1 Product overview

The RVM-400-Series transducers are RealVision Max 3D stainless steel thru-hull transducers.

In conjunction with a **RealVision Max 3D**-variant MFD / chartplotter running **LightHouse 4** software, or a **LightHouse 4**-compatible MFD / chartplotter and RVM1600 sonar module, the RVM-400-Series transducers produce realistic 3D representations of the objects below your vessel, to help you identify underwater structures and locate fish.

RealVision Max 3D transducers benefit from improved ping rates and tighter beamwidths, resulting in sharper sonar images, detailed wrecks, and distinct fish targets. RealVision Max 3D transducers also provide higher contrast color palettes for accentuating targets, allowing fish targets to stand out from the water column noise.

Sonar channels

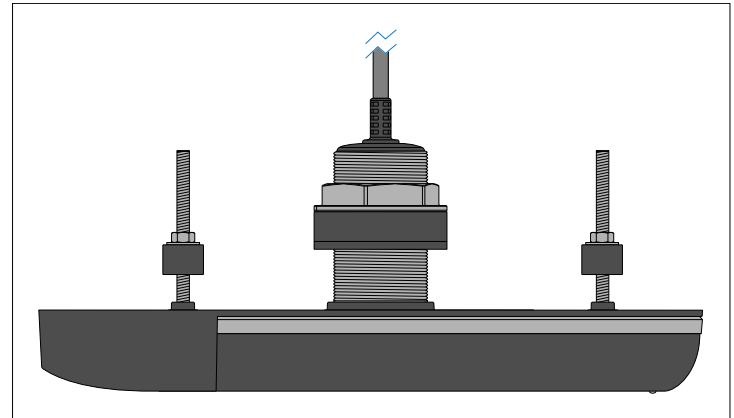
- RealVision Max 3D transducers offer the following sonar channels:
 - RealVision® Max 3D
 - SideVision®
 - DownVision®
 - Conical High CHIRP / Low CHIRP 600 W / 200 kHz
- RealVision Max 3D transducers include a built-in AHRS (Attitude and Heading Reference System) sensor, which helps stabilize 3D imaging automatically, by compensating for vessel motion.

Stainless steel transducers are suitable for installation on vessels with fiberglass, metal, or wooden hulls.

Important:

- When installing the transducer on a vessel that has a metal hull, you must use ALL of the supplied isolator parts to ensure that the transducer metalwork is **fully isolated from the metal hull**.
- Do NOT install stainless steel transducers on vessels with a positive ground system.

The RVM-400-Series includes 5 transducer variants, each having the same external shape and dimensions, but differing in their suitability for vessels, depending on the deadrise angle installation requirement.



Transducer variants

The transducers differ internally, and contain different numbers and types of transmit and receive elements. Your installation should comprise either a single **RVM-400** transducer, or a split-pair of **RVM-412** or **RVM-420** transducers.

The hull geometry of your vessel determines the most appropriate transducers to use. You should fit transducers whose elements are angled to match within $\pm 6^\circ$ of your hull's deadrise angle, as detailed below:

Variant	Deadrise angle	Split pair
• RVM-400 (A80704)	0° (suitable for a deadrise angle of 0° to 6°)	N/A
• RVM-412P (Port) (A80705)	12° (suitable for a deadrise angle of 6° to 18°)	T70543
• RVM-412S (Starboard) (A80706)		
• RVM-420P (Port) (A80707)	20° (suitable for a deadrise angle of 14° to 26°)	T70544
• RVM-420S (Starboard) (A80708)		

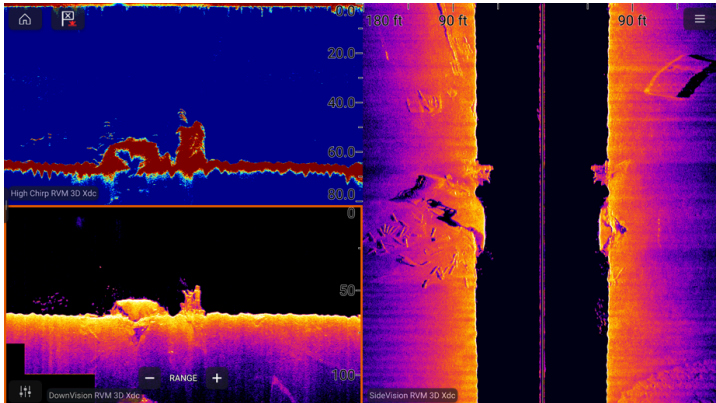
RealVision Max 3D overview

Explanation of the RealVision Max sonar technology and its key benefits.

RealVision Max 3D transducers offer the following range of improvements over RealVision 3D transducers:

- Improved ping rates and tighter beamwidths, resulting in sharper sonar images, detailed wrecks, and distinct fish targets.
- Higher resolution DownVision® and SideVision® imaging, combined with higher contrast color palettes — making it easier to identify structure, and allowing fish targets to stand out from the water column noise.
- More accurate target location capability, making it easier to pinpoint the position of a wreck or set up a drift.
- New 600 W High CHIRP frequency provides deeper traditional sonar range and stronger target returns.

RealVision Max 3D screen example



Sonar range

The sonar range is the effective depth or distance that the transducer can operate to, **in optimum weather conditions**.

The following ranges apply to RealVision® 3D / RealVision® Max 3D sonar channels:

Note:

The listed sonar channel ranges are indicative only, and may differ depending on the transducer in use, the installation, and the prevailing water conditions.

Sonar channel	Range
CHIRP sonar:	0.6 m (2 ft) to 366 m (1,200 ft)
DownVision®:	0.6 m (2 ft) to 183 m (600 ft)
SideVision®:	0.6 m (2 ft) to 91 m (300 ft)
RealVision® 3D / RealVision® Max 3D:	0.6 m (2 ft) to 91 m (300 ft)

Compatible sonar modules and displays

Transducers must be connected to a compatible sonar module to interpret and transmit the sonar image to a display screen. The sonar module may be external or internal (built-in) to the display.

Your transducer is compatible with the following sonar modules:

- Axiom™ 2 Pro range of MFDs, which include a compatible internal sonar module.
- RVM1600 RealVision™ Max 3D external sonar module.

Note:

The transducer is NOT compatible with the RVX1000 RealVision™ 3D external sonar module, or the internal sonar modules built-in to Axiom™, Axiom™+ and Axiom™ Pro MFDs.

Transducer cable length

The transducer includes a captive cable, for connecting to a compatible MFD / chartplotter or sonar module.

The length of the captive cable fitted to the transducer is:

- **RVM-400** — 8 m (26.2 ft)
- **RVM-412** and **RVM-420** — 2 m (6.5 ft)

RealVision transducer extension cables

Transducers are supplied with a fitted cable, for some installations (including all split-pair transducer installations) it may be necessary to extend the length of the transducer cable.

Note:

- For best performance, cable runs should be kept to a minimum.
- Only use Raymarine transducer extension cables.

RealVision offers the following optional extension cables are available:

- **RealVision** transducer extension cable 3 m (9.8 ft) (part number A80475)
- **RealVision** transducer extension cable 5 m (16.4 ft) (part number A80476)
- **RealVision** transducer extension cable 8 m (26.2 ft) (part number A80477)

Split pair transducers: Extension cables fitted between the transducer and the 'Y' cable must be fitted in equal length pairs (i.e.: each transducer's final cable length must be the same).



Warning: Maximum transducer cable length

The maximum length of cable between the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module (including the transducer's captive cable) must NOT exceed 18 m (59 ft). Transducer cable lengths greater than this may cause damage to the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module.

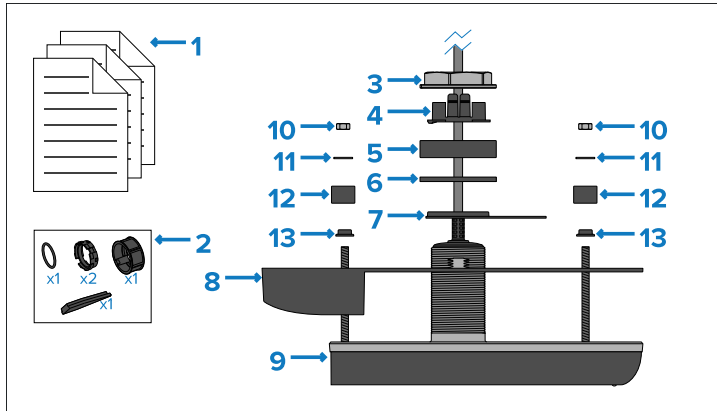
CHAPTER 4: PARTS SUPPLIED

CHAPTER CONTENTS

- 4.1 Parts supplied — RVM-400-Series transducers — page 17
- 4.2 Additional parts supplied — page 17

4.1 Parts supplied — RVM-400-Series transducers

The following parts are supplied with each RVM-400-Series transducer.

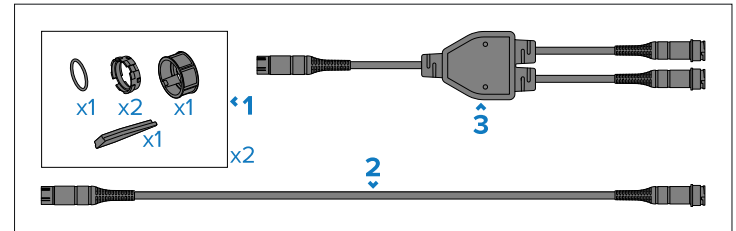


Description	
1	Documentation pack
2	Locking collar kit (for transducer cable connector), consisting of: <ul style="list-style-type: none"> • 2 x Split rings (includes spare) • 1 x O-ring • 1 x Locking collar • 1 x Split ring fitting tool
3	Hull nut
4	Cable protector
5	Large internal isolator sleeve
6	Rubber washer
7	External isolator plate
8	High speed nose cone

Description	
9	Transducer (including fitted cable — for the length, refer to: p.14 — Transducer cable length)
10	2 x Nuts for anti-rotation studs
11	2 x Small washers for anti-rotation studs
12	2 x Small internal isolator sleeves
13	2 x External isolator sleeves

4.2 Additional parts supplied

The following additional cables are supplied when ordering a split pair set of transducers.



Description	
1	2 x Locking collar kit, consisting of: <ul style="list-style-type: none"> • 2 x Split rings (includes a spare) • 1 x O-ring • 1 x Locking collar • 1 x Split ring fitting tool
2	Extension cable 8 m (26.2 ft.), for connecting the single end of the “Y-cable” adapter to a compatible MFD / chartplotter, or sonar module.
3	“Y-cable” adapter for connecting a split pair of transducers to a single extension cable. Cable length: 0.3 m (0.98 ft.)

CHAPTER 5: PRODUCT DIMENSIONS

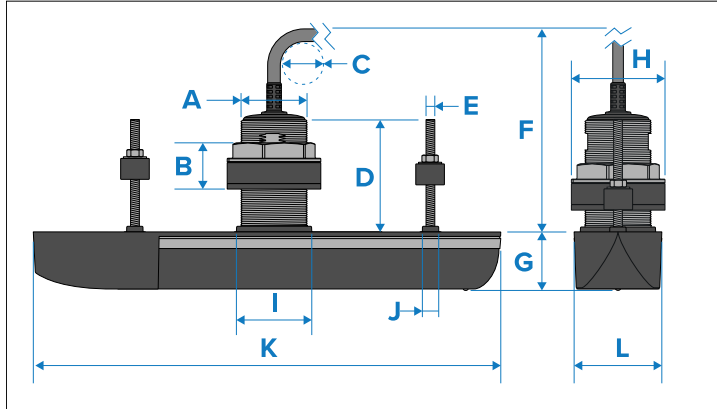
CHAPTER CONTENTS

- [5.1 Transducer dimensions — RVM-4xx — page 19](#)

5.1 Transducer dimensions — RVM-4xx

The dimensions relevant for installation are shown below.

All transducers in the RVM-4xx series have the same external dimensions.



Dimension	
A	60.00 mm (2.36 in)
B	42.00 mm (1.65 in)
C	35.00 mm (1.40 in)
D	101.70 mm (4.00 in)
E	8.00 mm (0.31 in)
F	170.60 mm (6.72 in)
G	53.30 mm (2.10 in)
H	85.00 mm (3.35 in)
I	68.00 mm (2.68 in)
J	14.90 mm (0.59 in)
K	424.69 mm (16.72 in)
L	79.64 mm (3.14 in)

Nut sizes

- Hull nut — 68 mm (2 ¾ in) across flats
- Anti-rotation nut — 13 mm (½ in) across flats

Transducer cable length

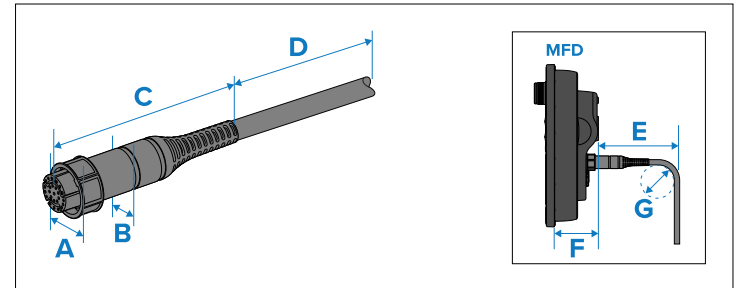
The length of the cable fitted to the transducer is:

- **RVM-400** — 8 m (26.2 ft)
- **RVM-412** and **RVM-420** — 2 m (6.5 ft)

RealVision transducer cable connector dimensions

The dimensions of the transducer cable and cable connector are shown below.

Cable connector dimensions



Dimension	
A	32.00 mm (1.26 in)
B	25.00 mm (1.00 in)
C	96.00 mm (3.80 in)
D	Cable length: <ul style="list-style-type: none"> • Single (All-in-one) transducer fitted cable length: 8 m (26.2 ft). • Split pair transducer fitted cable length: 2 m (6.5 ft).
E	This dimension is dependent on your MFD variant. Refer to your MFD installation instructions.

Dimension	
F	This dimension is dependent on your MFD variant. Refer to your MFD installation instructions.
G	35.00 mm (1.40 in)

Note:

For installations where space behind the display is limited, a right-angled transducer cable adaptor is available (A80515). Using the right-angled cable adaptor will reduce dimension **E** (listed above) by 20 mm (0.79 in.)

CHAPTER 6: LOCATION REQUIREMENTS

CHAPTER CONTENTS

- 6.1 Warnings and cautions — page 22
- 6.2 Location requirements — page 22
- 6.3 EMC installation guidelines — page 24

6.1 Warnings and cautions

Important:

Before proceeding, ensure that you have read and understood the warnings and cautions provided in the following section of this document:

- p.7 — Important information



Warning: Switch off power supply

Ensure that 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 to do so in this document.

6.2 Location requirements

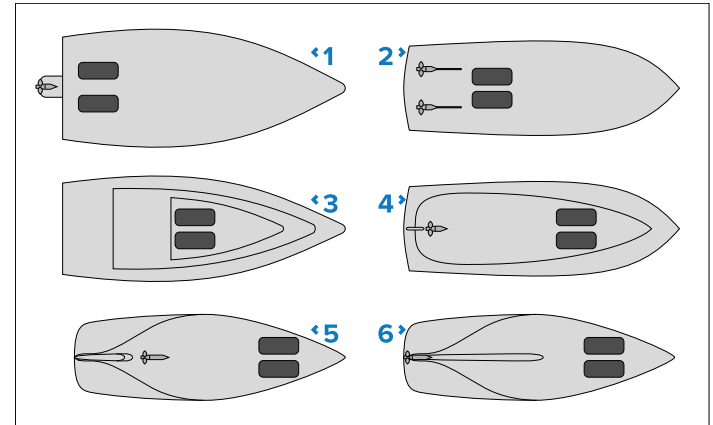
Follow the guidelines below when selecting a location for your single transducer or split-pair transducers.

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

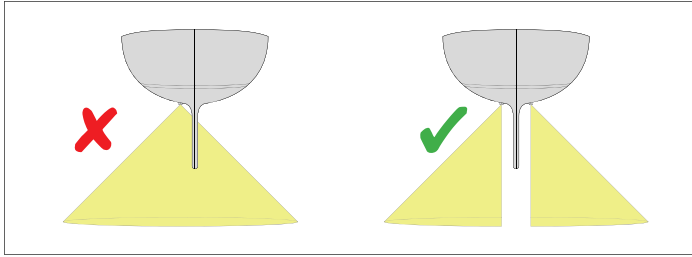
Important:

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

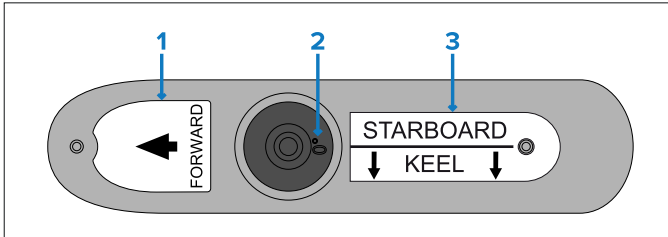
- Transducers should be installed as close to the center line of the vessel as possible.



1. **Outboard or I/O (Planing hull)** — mount forward and to the side of the propeller(s).
 2. **Inboard (Planing hull)** — mount forward of the propeller(s) and shaft(s).
 3. **Stepped hull (Planing hull)** — mount on the first step as far aft as possible.
 4. **Displacement hull** — mount approximately 1/3 of the way along the length of the hull, measured along the waterline.
 5. **Fin keel (Keel sailboat)** — mount forward of the keel, ensuring that the keel will not obstruct the transducers wide beam width.
 6. **Full keel (Keel sailboat)** — 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 mounting surface should be flat so that transducer sits flush against the hull.
 - When installing split-pair transducers with angled elements, you must ensure that the hull's deadrise angle at the chosen mounting location is appropriate for the selected transducers.
 - 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.

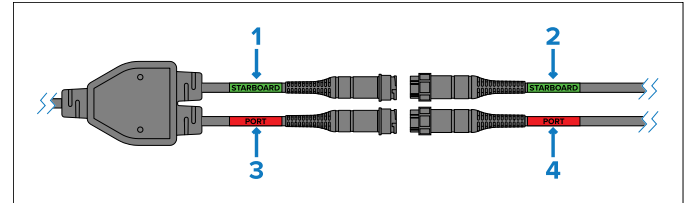


- The transducers should be installed away from any protrusions such as other transducers, steps, ribs, strakes, or rows of rivets.
- Transducers should be installed in a location where no load will be applied to the transducers during, launching, lifting, trailering and storage of the boat.
- Transducers 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 anti-rotation bolt cap.
- When installing split-pair transducers:
 - the correct transducer (port or starboard) must be installed in the matching (port or starboard) side of the hull. The transducers have labels on the top face that identify which side they should be installed on and the transducer's element angle:



1. Direction to vessel bow
2. Element angle and vessel side:
 - ◆ Single (all-in-one) transducers are marked “0°”
 - ◆ Split pair (“12°” or “20°”)
 - ◆ Split pair — port, “P” or starboard, “S”
3. Split pair — Vessel side and direction to vessel keel (Single all-in-one transducers do not include this label.)

- each transducer in a split pair have labels on the transducer cables and also labels on the accompanying ‘Y’ cable which identify the side:



1. **Green** — Starboard-side Y cable.
 2. **Green** — Starboard side transducer cable.
 3. **Red** — Port side Y cable.
 4. **Red** — Port side transducer cable.
- 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.



Warning: 2–person installation required

To prevent potential product damage, vessel damage or personal injury, the installation of this product requires 2 people.

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.

6.3 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 (3.28 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 (6.56 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.

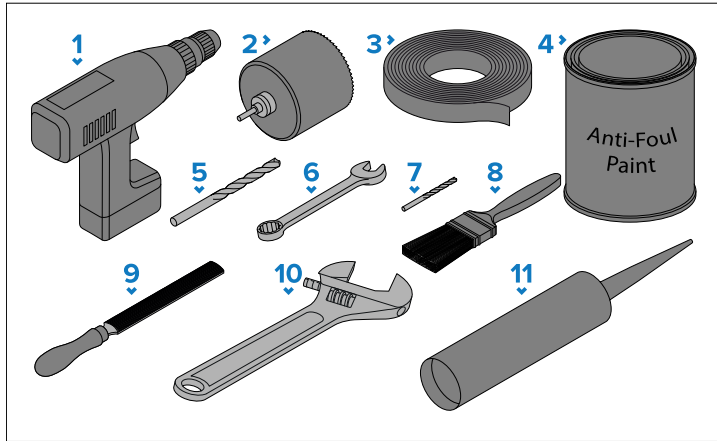
CHAPTER 7: INSTALLATION

CHAPTER CONTENTS

- 7.1 Tools required — page 26
- 7.2 Testing the transducer — page 26
- 7.3 Transducer mounting — page 27

7.1 Tools required

The following tools are required to install any of the transducers listed under “Applicable products”.



1. Power drill
2. Hole cutter suitable for 68 mm ($2\frac{43}{64}$ inch) external isolator plate boss⁽¹⁾
3. Masking / adhesive tape
4. Water based anti-fouling paint
5. Drill bit suitable for 15 mm ($\frac{19}{32}$ inch) external isolator sleeve boss⁽¹⁾
6. 13 mm ($\frac{1}{2}$ inch) wrench (spanner) or suitable size adjustable wrench (spanner)
7. Drill bit (suitable for pilot holes)
8. Paint brush (for application of anti-fouling paint)
9. Half round file
10. Large adjustable wrench (spanner) suitable for hull nut 68 mm ($2\frac{3}{4}$ inch)
11. Marine grade sealant

Note:

(1) It is recommended that you cut holes the same size as the stated values and then, if necessary, carefully file the hole to allow parts to be fitted correctly.

If a hole cutter / drill bit of the specified size(s) is not available, use a slightly smaller size and then carefully file the hole to the correct size. Alternatively, for larger holes, you could use a jigsaw to cut the hole and then carefully file the edge to create a circle the required size.



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.

7.2 Testing the transducer

Transducer operation should be checked before installation. For the purposes of this test you do not need to assemble the connector locking collar.

For detailed information on using the Fishfinder / Sonar app please refer to the operation instructions for your MFD.

1. Connect the transducer to the relevant connector on your MFD or sonar module that is connected to your MFD.
2. Fully submerge the transducer in water.
3. Power up your MFD and / or Sonar module.
4. Open a Fishfinder / Sonar app on your MFD.
5. If required, select the relevant transducer from the Transducer settings tab (*[Menu > Transducer > Transducer]*).
6. If required, select the relevant channel from the Channel selection options (*[Menu > All channels]*).
7. Check that accurate depth and where applicable temperature readings are displayed.
8. 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.

7.3 Transducer mounting

Read the following mounting procedure **before** attempting to mount the transducer.

Stainless steel transducers are suitable for installations on vessels with fiberglass, metal or wooden hulls.

Important:

- You must use ALL of the supplied parts when installing the transducer.
- When installing the transducer on a vessel that has a metal hull, the supplied isolator parts ensure that the transducer metalwork is fully isolated from the metal hull, to prevent galvanic corrosion. Following installation, it's important to clean the transducer regularly and carefully, to ensure that there is no growth or attached material bridging the gap between the metal part of the transducer and the metal hull, compromising the isolation.
- **Do NOT install stainless steel transducers on vessels with a positive ground system.**

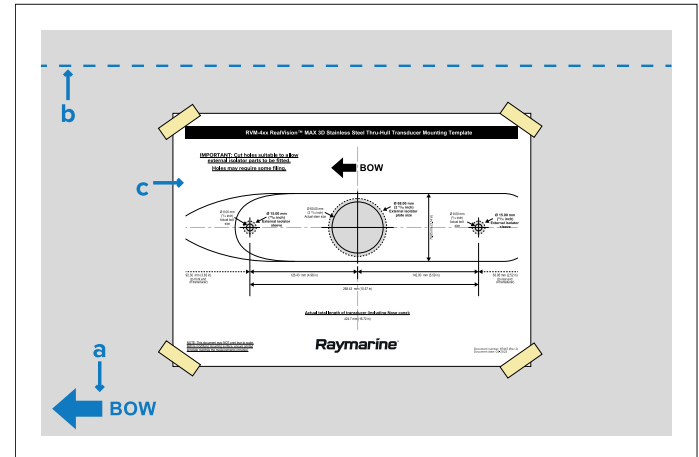
Important:

- 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, which may result in water leaking into the vessel.

Drilling holes in the hull

To install a thru-hull transducer, you must drill 3 holes in the vessel's hull. Use the supplied mounting template to mark the hole locations.

1. Ensure that you are using the correct transducer for your chosen mounting location (i.e.: port / starboard, 0°, 12°, or 20° tilted element transducer).
2. Using self-adhesive tape, attach the supplied mounting template to your chosen mounting location, ensuring that:



- i. the 'Bow' arrow on the template is pointed towards the vessel's bow.
 - ii. the mounting template is parallel to the centerline of the vessel.
 - iii. the template is flat and not creased.
3. Pierce the template at each hole center and mark the hole locations on the hull using a pencil or marker.
 4. Remove the template from the hull.
 5. Drill a pilot hole for the transducer stem hole.
 6. ⁽¹⁾ Drill a hole suitable for the 68 mm (2 43/64 in) boss on the top of the external isolator plate. **The boss on the external isolator plate must sit inside the hull.**

Note:

(1) It is recommended that you cut holes that are the same size as the stated values and then, if necessary, carefully file the hole to allow parts to be fitted correctly.
If a hole cutter / drill bit of the specified size(s) is not available, use a slightly smaller size and then carefully file the hole to the correct size. Alternatively, for larger holes, you could use a jigsaw / router to cut the hole. Then carefully file the edge to create a hole of the required size.

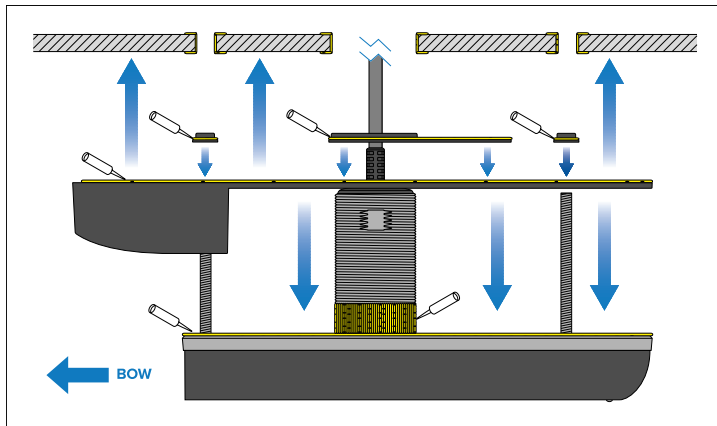
- Using a half-round file and / or sandpaper, ensure that there are no rough edges or burrs around the transducer stem hole.
- Drill the two 15 mm ($19/32$ in) holes for the anti-rotation bolts.

Assembling the external components

The steps below will guide you through the assembly of the external components.

Note:

To achieve a long lasting watertight seal, ensure that all parts are clean and dry and apply a generous amount of marine-grade sealant to all mating surfaces.



- Ensure correct orientation using the markings and labels on the top face of the transducer.

- Remove the orientation labels and clean to ensure there is no residual label glue.
- Using an appropriate cloth and cleaning agent (for example: isopropyl alcohol), wipe clean ALL surfaces of the supplied components and the mounting location, both outside and inside the hull ensuring that they are free from grease and debris.
- Ensure all surfaces are dry.
- Apply a thick bead of marine-grade sealant all over the top face of the transducer so that it is completely covered.
- Feed the transducer cable, stem and anti-rotation studs through the holes in the high speed nose cone, positioning the high speed nose cone over the transducer, and then slide the transducer into the nose.
- Apply pressure to the high speed nose cone, to compress the sealant against the transducer.
- Feed the transducer cable through the stem hole in the external isolator plate, and then position the external isolator plate in the recess in the top of the high speed nose cone.
- Feed an external isolator sleeve over both of the anti-rotation studs, positioning them in the hole recesses in the top of the high speed nose cone.
- Apply a thick bead of marine-grade sealant:
 - all over the top face of the high speed nose cone, external isolator plate, and external isolator sleeves, ensuring that they are completely covered.
 - all around the bottom part of the threaded section of the transducer stem and the anti-rotation studs, ensuring that the sealant will protrude approximately 6 mm (0.24 in) above the final tightened nuts.
 - all around and inside the holes you have drilled in the hull.
- Guide the transducer cable through the large stem hole in the hull.
- Guide the transducer stem and anti-rotation studs up through the holes in the hull.
- Support the transducer from beneath.

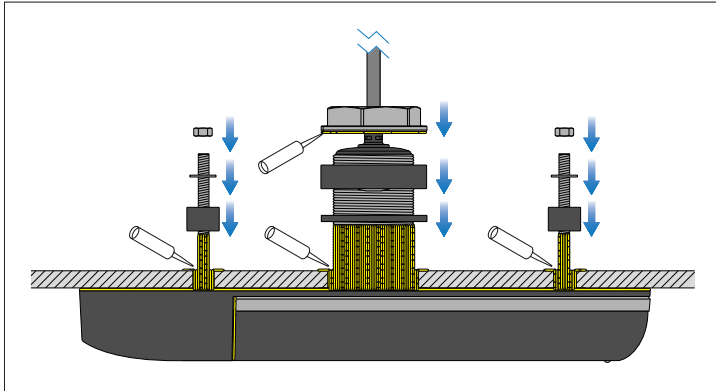
Assembling the internal components

Follow the steps below to fit the transducer to your hull.

Note:

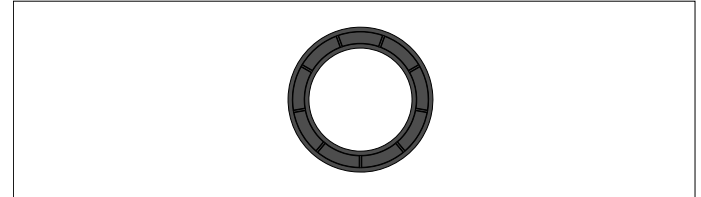
To achieve a long lasting watertight seal, ensure that all parts are clean and dry and apply a generous amount of marine-grade sealant to all mating surfaces.

Mounting and sealant application



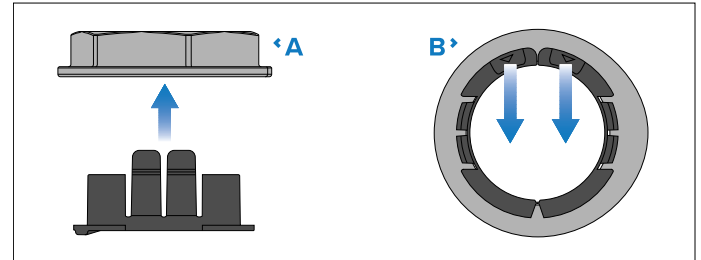
1. From inside the vessel, apply a continuous, thick bead of marine-grade sealant all around the base of the protruding transducer stem and anti-rotation bolt threads.
2. Guide the rubber washer down the transducer cable, and over the threaded section of the transducer stem, compressing the sealant so that the rubber washer sits flush on the hull.
3. If necessary, apply additional marine-grade sealant to the transducer stem, above the rubber washer.
4. With the top face pointing upwards, guide the large isolator bush down the transducer cable and over the transducer stem, ensuring it sits flush on the rubber washer.

Large isolator bush top face



5. If necessary, apply additional marine-grade sealant to the transducer stem, above the large isolator bush.
6. Ensuring the cable protector is fitted to the hull nut, guide the nut down the transducer cable, resting the nut on top of the transducer stem.

Cable protector fitting and removal



• **A** – Fitting

• **B** – Removal

7. Remove the cable protector by pulling the 2 tabs away from the back of the hull nut.
8. Apply a thick bead of marine grade sealant to the bottom face of the hull nut.
9. Screw the hull nut onto the transducer stem so that it is hand tight.
10. From outside the vessel ensure that the transducer is pushed fully in to the high speed nose cone.

It is recommended that a second person holds the high speed nose cone in place whilst the stem and anti-rotation nuts are fully tightened.

11. Fully tighten, using a 70 mm (2 3/4 inch) wrench (spanner) or large adjustable wrench.

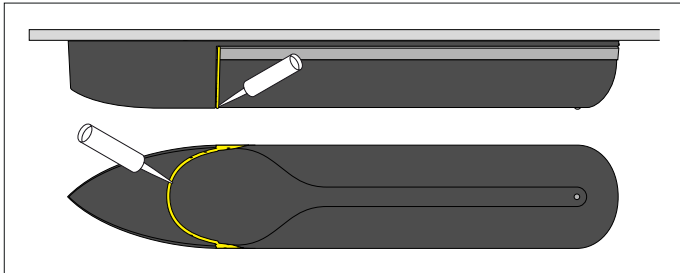
Ensure that the hull nut is adequately tightened. You should see the sealant protruding from the edges of all applied surfaces.

12. Place the small internal isolator sleeves over the anti-rotation studs, ensuring they sit flush on the interior of the hull.
13. If necessary, apply additional marine-grade sealant to the anti-rotation studs, above the small internal isolator sleeves.
14. Place the small washers over the anti-rotation studs.
15. If necessary, apply additional marine-grade sealant to the anti-rotation studs above the small washer.
16. Screw the anti-rotation nuts onto the studs and fully tighten, using a 13 mm (1/2 inch) wrench (spanner) or adjustable wrench.

Finalizing the installation

Follow the steps below to finalize the transducer installation.

1. Apply a thick bead of marine-grade sealant in the gap between the transducer and nose cone on the bottom and both sides, as shown below:



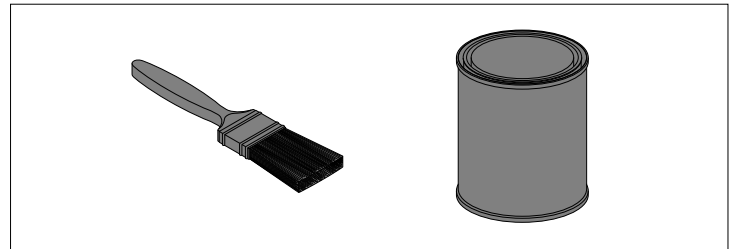
2. Remove any excess sealant on the outside of the hull and transducer, ensuring a smooth transition between nose cone and transducer, and transducer and hull.
3. Ensure that the marine-grade sealant has fully cured.
Refer to the sealant manufacturer's instructions for curing times.
4. Unless local environmental 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.
5. Check for leaks around the transducer immediately upon returning the vessel back in the water.
6. Continue to check for leaks at regular intervals after installation, until you are satisfied that there are no leaks.
7. Add a regular check for leaks around the transducer 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 barnacles and other organic growth, which can cause increased drag that will degrade sonar 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 ketone-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.

CHAPTER 8: CABLES AND CONNECTIONS — GENERAL INFORMATION

CHAPTER CONTENTS

- [8.1 General cabling guidance — page 32](#)

8.1 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 during installation and that all cables are properly shielded.

Important:

Be aware that some **third-party** cables and adapters (for example, certain Ethernet cables using RJ45 connectors) are not always shielded. To prevent breaks in cable shielding continuity and potential grounding issues, special attention is required to ensure that any cables, extension cables, adapters, or other signal-coupling devices used in cable runs **maintain all shield connections throughout the cable run.**

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.

CHAPTER 9: CONNECTIONS

CHAPTER CONTENTS

- 9.1 Cable routing — page 34
- 9.2 Attaching the connector locking collar — page 34
- 9.3 RVM-400 connection — page 35
- 9.4 RVM-412 / RVM-420 connection — page 35
- 9.5 Transducer cable length — page 35
- 9.6 RealVision transducer extension cables — page 36
- 9.7 Maximum transducer cable length — page 36
- 9.8 Making connections — page 36

9.1 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 cables as possible.

Important:

The transducer cable's connector is supplied with a separate locking collar assembly. Ensure that you route the cable all the way to your compatible sonar module or MFD **before** attaching the locking collar.

- Check that the cable is long enough. If you are installing split-pair transducers, you must use a Y-cable (A80478) along with an extension cable to connect the transducers to your compatible sonar module or MFD.
- Use grommets in any pass-through holes to prevent damage to the transducer cable.
- Secure the cable at regular intervals using suitable cable clips (not supplied).
- Take care not to apply excessive strain to the cable where it leaves the transducer. Where possible, allow the cable to lay naturally as it leaves the transducer, before securing it with cable clips.
- Do not bend the transducer cable beyond its minimum bend radius. This is particularly important at the point where the cable leaves the transducer.
- Any excess cable should be coiled up at a convenient location.

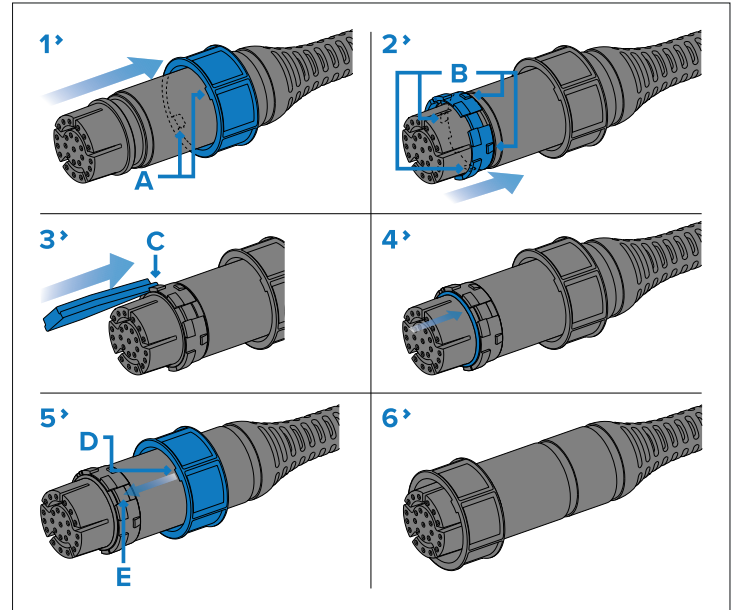
9.2 Attaching the connector locking collar

The supplied cable is provided with a separate locking collar assembly, ensuring that the cable connection is secure.

This procedure describes how to attach the locking collar to the cable connector. The locking collar parts are supplied in a separate bag, in the package with your product.

Important:

Ensure that you route the cable all the way to its destination **before** attaching the locking collar.



1. Slide the locking collar over the end of the connector, then push it towards the cable-end of the connector. Ensure that the lugs on the locking collar (labelled 'A' in the illustration), are closest to the plug-end of the connector.
2. Slide the split-ring over the end of the connector, then push it towards the cable-end of the connector. Ensure that the tabs on the split-ring (labelled 'B' in the illustration), are closest to the cable-end of the connector.

The split-ring slides easily for approximately 1 cm (0.39 in) onto the connector, before butting up against the connector moulding.

3. Carefully insert the pointed end of the supplied tool into the split-ring's gap (labelled 'C' in the illustration). Use the tool to gently lever the split ring over the moulding on the connector until it snaps into position approximately 0.5 cm further back towards the cable-end of the connector.

Always use the supplied tool when attaching the split ring. The split ring may become overstretched and break if you try to attach it without using the tool. A spare split ring is supplied with the locking collar assembly, in case of breakage.

4. Slide the O-ring (arrowed) over the end of the connector, and ensure that it is seated squarely against the connector moulding, adjacent to the split-ring.
5. Slide the locking collar towards the plug-end of the connector, rotating the collar as necessary to ensure that the lugs on the locking collar (labelled 'D' in the illustration) pass through the channels (labelled 'E') in the split-ring.

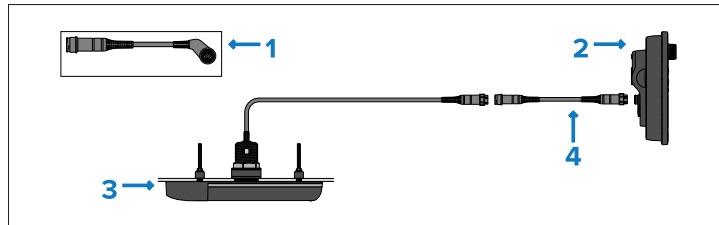
The locking collar slides easily towards the plug-end of the connector, before butting up against the split-ring moulding.

6. Grasp the body of the connector with one hand, then with the other hand, pull the locking collar firmly towards the plug-end of the connector.

As you pull the locking collar, it clicks into place over the split-ring. The locking collar stays in position on the connector, but rotates freely.

9.3 RVM-400 connection

The all-in-one transducer can be connected directly to the MFD or sonar module.

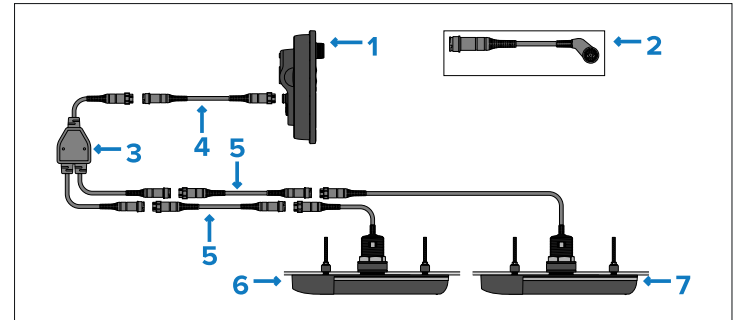


1. Optional right-angled adaptor (A80515), supplied separately (used to reduce the space required behind an MFD).
 2. Compatible MFD or sonar module.
 3. Transducer.
 4. To extend the cable run, optional extension cables can be fitted between the transducer and the MFD or sonar module.
- For compatible MFD and sonar modules refer to: [p.14 — Compatible sonar modules and displays](#)

- For details on extension cables refer to: [p.36 — RealVision transducer extension cables](#)

9.4 RVM-412 / RVM-420 connection

Split pair transducers are connected to the MFD or sonar module using the supplied 'Y' cable and extension cable.



1. Compatible MFD or sonar module.
2. Optional right angled adaptor (A80515) supplied separately (used to reduce the space required behind an MFD).
3. 'Y' cable (supplied)
4. 8 m (26.2 ft) extension cable (supplied)
5. Optional extension cables can be fitted between the transducer and 'Y' cable if required, or between supplied extension cable and MFD or sonar module.
6. Transducer, e.g.: RVM-412 Port.
7. Transducer, e.g.: RVM-412 Starboard.

- For compatible MFD and sonar modules, refer to: [p.14 — Compatible sonar modules and displays](#)
- For details on extension cables, refer to: [p.36 — RealVision transducer extension cables](#)

9.5 Transducer cable length

The transducer includes a captive cable, for connecting to a compatible MFD / chartplotter or sonar module.

The length of the captive cable fitted to the transducer is:

- **RVM-400** — 8 m (26.2 ft)
- **RVM-412** and **RVM-420** — 2 m (6.5 ft)

9.6 RealVision transducer extension cables

Transducers are supplied with a fitted cable, for some installations (including all split-pair transducer installations) it may be necessary to extend the length of the transducer cable.

Note:

- For best performance, cable runs should be kept to a minimum.
- Only use Raymarine transducer extension cables.

RealVision offers the following optional extension cables are available:

- **RealVision** transducer extension cable 3 m (9.8 ft) (part number A80475)
- **RealVision** transducer extension cable 5 m (16.4 ft) (part number A80476)
- **RealVision** transducer extension cable 8 m (26.2 ft) (part number A80477)

Split pair transducers: Extension cables fitted between the transducer and the 'Y' cable must be fitted in equal length pairs (i.e.: each transducer's final cable length must be the same).

9.7 Maximum transducer cable length

The maximum length of cable between the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module (including the transducer's captive cable) must NOT exceed 18 m (59 ft). Transducer cable lengths greater than this may cause damage to the RealVision® 3D / RealVision® Max 3D transducer and the MFD / chartplotter or sonar module.

9.8 Making connections

Follow the steps below to connect the transducer cable to a RealVision™ Max 3Dsonar-capable device (i.e.: Axiom™ 2 Pro MFD or RVM1600 sonar module).

1. Ensure that the vessel's power supply is switched off.
2. Connect cables as follows:
 - i. Connect the cable from each transducer to the Y-cable tails (A80478); check the colored labels on the cables to ensure that the transducers are connected to the correct Y-cable tail.
 - ii. Connect an extension cable to the remaining free plug on the Y-cable. See [p.36 — RealVision transducer extension cables](#).
3. Ensuring correct orientation, push the transducer cable (or extension cable) connector fully onto the corresponding connector on your MFD or sonar module.
4. Turn the locking collar clockwise to secure the cable.

CHAPTER 10: SYSTEM CHECKS AND TROUBLESHOOTING

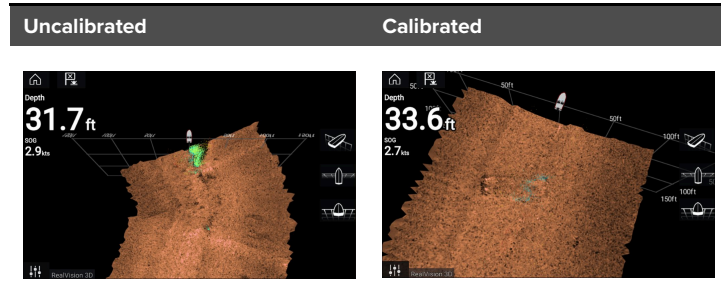
CHAPTER CONTENTS

- [10.1 RealVision™ AHRS calibration — page 38](#)
- [10.2 Troubleshooting — page 38](#)

10.1 RealVision™ AHRS calibration

RealVision™ transducers include a built-in AHRS (Attitude and Heading Reference Sensor), which measures the motion of your vessel to assist in the rendering of sonar images. After installation all RealVision™ transducers require calibration.

An uncalibrated transducer can produce an offset to the front edge of the render of the bottom in the sonar image, as illustrated below.



Calibration is an automatic process and starts after your vessel has turned approximately 100° at a speed of between 3 –15 knots. Calibration requires no user input, however at least a 270° turn is required before the calibration process can determine the local deviation and apply a relevant offset.

The time it takes to complete the calibration process will vary according to the characteristics of the vessel, the installation environment of the transducer, and the levels of magnetic interference at the time of conducting the process. Sources of significant magnetic interference may increase the time required to complete the calibration process. Certain areas with substantial magnetic deviation may require extra circles or “figure of 8” manoeuvres to be performed. Examples of such sources of magnetic interference include:

- Vessel engines
- Vessel alternators
- Marine pontoons
- Metal-hulled vessels
- Underwater cables

Note:

In some circumstances, it is beneficial to disable RealVision AHRS if local sources of magnetic interference are distorting the sonar image. RealVision AHRS can be disabled from [Settings]. [Menu > Settings > Sounder > AHRS stabilization]

Note:

The Calibration process will require repeating after a [Sonar reset] or MFD [Factory reset].

10.2 Troubleshooting

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

Before packing and shipping, all 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 to restore normal operation.

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

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.bit.ly/rym-docs

Sonar troubleshooting

Scrolling image is not being displayed

Possible causes	Possible solutions
Sonar disabled	Enable [<i>Ping</i>] from the Fishfinder app's sounder tab: [<i>Menu</i> > <i>Settings</i> > <i>Sounder</i> > <i>Ping enable</i>].
Incorrect transducer selected	Check that the correct transducer is selected in the Fishfinder app's Transducer tab: [<i>Menu</i> > <i>Settings</i> > <i>Transducer</i>].
Damaged cables	<ol style="list-style-type: none">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-start or lose 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 application to stop scrolling or the unit to reset / switch 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.

Possible causes	Possible solutions
Wrong transducer fitted	Check product and transducer documentation and ensure that the transducer is compatible with your system.
External sonar module: network connection problem.	Check that the unit is correctly connected to your display or network switch. Check all connections to ensure that they are secure, clean and free from corrosion. Replace if necessary.
External sonar module: software mismatch between equipment may prevent communication.	Ensure that all Raymarine products are updated to the latest available software. Check the Raymarine website for software compatibility: www.bit.ly/rym-software

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 re-check.
Transducer kicked-up	If the transducer has a kick-up mechanism, check that it has not kicked up due to hitting an object.
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 <i>Technical specification</i> for power supply requirements.)

Possible causes	Possible solutions
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris / fouling. If necessary, clean or replace the transducer. After cleaning or replacement, coat the transducer using a water-based anti-fouling paint.
Damaged cables	<ol style="list-style-type: none"> 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 switched on, try flexing the power cable near to the display connector to see if this causes the unit to re-start / lose power. Replace if necessary. 5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring that 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 / switch off). Replace if necessary.
Vessel speed too high	Slow vessel speed and recheck.

Possible causes	Possible solutions
Bottom too shallow or too deep	The bottom depth may be outside of the transducer's depth range. Move vessel to shallower or deeper waters as relevant, and re-check.
Ping depth limit set	<p>If using a transducer with greater than 600 W power, check if the <i>[Ping depth limit]</i> has been enabled: <i>[Menu > Settings > Transducer > Ping depth limit]</i>.</p> <p>If you are in water deeper than the specified <i>[Ping depth limit]</i>, the transducer may not provide depth readings. Disable or adjust setting and retry.</p>

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.

Possible causes	Possible solutions
Damaged cables	<ol style="list-style-type: none"> 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 switched on, try flexing the power cable near to the display connector to see if this causes the unit to re-start / lose power. Replace if necessary. 5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring that 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 / switch off). Replace if necessary.
Transducer location	<ul style="list-style-type: none"> • 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.

Possible causes	Possible solutions
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 re-check.
Interference from another transducer	<ol style="list-style-type: none"> 1. Turn off the transducer causing the interference. 2. Re-position the transducers so that 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 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 11: MAINTENANCE

CHAPTER CONTENTS

- 11.1 Routine checks — page 43
- 11.2 Transducer cleaning — page 43
- 11.3 Bridging material removal — page 43
- 11.4 Re-applying anti-fouling paint — page 43

11.1 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.

11.2 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:

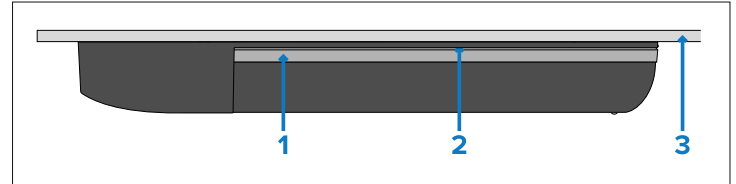
- Use a soft cloth and a mild household cleaning detergent to clean mild growth build up.

- 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.

11.3 Bridging material removal

On metal hulled vessels, to prevent galvanic corrosion, the metal parts of your stainless steel transducer must NOT touch the hull. The included high speed nose cone and isolation parts ensure a gap exists between the two surfaces.

When cleaning your transducer, particular attention must be given to the edge of the high speed nose cone. **Ensure that there is no growth or material attached that bridges the gap between the metal part of the transducer and a metal hull.**



1. Metal part of transducer.
2. High speed nose cone.
3. Metal hull.

11.4 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 12: TECHNICAL SUPPORT

CHAPTER CONTENTS

- 12.1 Raymarine technical support and servicing — page 46
- 12.2 Learning resources — page 47

12.1 Raymarine technical 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.

Servicing and warranty

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

Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online:

- www.bit.ly/rym-warranty

United Kingdom (UK), EMEA, and Asia Pacific:

- Web: www.bit.ly/rym-service
- Tel: +44 (0)1329 246 932

United States (US):

- Web: www.bit.ly/rym-service
- Tel: +1 (603) 324 7900

Web support

Please visit the “Support” area of the Raymarine website for:

- **Manuals and Documents** — www.bit.ly/rym-docs
- **Technical support forum** — www.bit.ly/rym-support
- **Software updates** — www.bit.ly/rym-software

Telephone and online support

Region	Contact details
All regions	Online support: www.bit.ly/rym-support
United Kingdom (UK) and EMEA	Telephone: +44 (0)1329 246 777 Address: Marine House, Cartwright Drive, Fareham, PO15 5RJ, UK.
United States (US)	Telephone: Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539) Address: 110 Lowell Road, Hudson, NH 03051, USA.
Australia and New Zealand (Raymarine subsidiary)	Telephone: +61 2 8977 0300 Address: Suite 1.01, 26 Rodborough Road, Frenchs Forest, NSW, 2086, Australia.
France (Raymarine subsidiary)	Telephone: +33 (0)1 46 49 72 30 Address: 35 avenue Michel Crépeau, 17000 La Rochelle - France.
Germany (Raymarine subsidiary)	Telephone: +49 40 237 808 0 Address: Atlantic-Haus, Zirkusweg 1, 20359 Hamburg.
Italy (Raymarine subsidiary)	Telephone: +39 02 9945 1001 Address: Via L. Manara 2, 20812 Limbiate (MB), Italy.
Spain (Authorized Raymarine distributor)	Telephone: +34 96 2965 102 Email: sat@azimut.es
Netherlands / Benelux (Authorized Raymarine distributor)	Telephone: +31 (0)26 3614 905 Address: Florijnweg 21G, 6883 JN VELD, Nederland.

Region	Contact details
Sweden (Raymarine subsidiary)	Telephone: +46 (0)317 633 670 Address: Bolshedens Industriväg 18, 427 50 Billdal, Sweden.
Finland (Raymarine subsidiary)	Telephone: +358 (0)207 619 937 Address: Suomalaistentie 1-3, 02270 Espoo, Finland.
Norway (Raymarine subsidiary)	Telephone: +47 692 64 600 Address: Årvollskogen 30, 1529 Moss, Norway.
Denmark (Raymarine subsidiary)	Telephone: +45 437 164 64 Address: Centervej 7, 4600 Køge, Denmark.
Russia (Distributor)	Telephone: Tel: +7 495 788 0508 Email: info@mikstmarine.ru

using their Raymarine equipment. The resource is regularly updated with contributions from Raymarine customers and staff:

- www.bit.ly/rym-support

12.2 Learning resources

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

Video tutorials

Raymarine official channel on YouTube

- <http://www.youtube.com/user/RaymarineInc>

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:

- www.bit.ly/rym-training

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

CHAPTER 13: TECHNICAL SPECIFICATION

CHAPTER CONTENTS

- 13.1 Physical specification — page 49
- 13.2 Environmental specification — page 49
- 13.3 RealVision Max 3D sonar specification — page 49
- 13.4 Conformance specification — page 50

13.1 Physical specification

Specification	
Dimensions:	<ul style="list-style-type: none">• Length: 424.69 mm (16.72 in) — including high speed nose cone• Height: 223.70 mm (8.81 in.) — including cable bend radius• Width: 79.64 mm (3.14 in) — including high speed nose cone
Cable length:	<ul style="list-style-type: none">• RVM-400: 8 m (26.2 ft)• RVM-412 / RVM-420: 2 m (6.5 ft) + 8 m (26.2 ft) extension cable = 10 m (32.8 ft)
Weight:	<ul style="list-style-type: none">• RVM-400: 4.56 kg (including cable)• RVM-412 / RVM-420: 3.87 kg (including cable)

13.2 Environmental specification

Specification	
Operating temperature range:	–2°C (28.4°F) to + 55°C (131°F)
Storage temperature range:	–20°C (23°F) to + 70°C (158°F)
Waterproof rating:	<ul style="list-style-type: none">• IPx6 (surfaces exterior to hull, only)• IPx7• IPx8

13.3 RealVision Max 3D sonar specification

The following specification only applies to RealVision® Max 3D products.

Specification	
Sonar channels:	<ul style="list-style-type: none">• RealVision® Max 3D (70 W / 350 kHz ± 30%)• SideVision® (70 W / 350 kHz ± 30%)• DownVision® (35 W / 350 kHz ± 30%)• Conical CHIRP: High (600 W / 200 kHz ± 10%)
Sensors:	<ul style="list-style-type: none">• Temperature sensor• AHRS (Attitude and Heading Reference System) sensor

Sonar range

The sonar range is the effective depth or distance that the transducer can operate to, **in optimum weather conditions**.

The following ranges apply to RealVision® 3D / RealVision® Max 3D sonar channels:

Note:	
The listed sonar channel ranges are indicative only, and may differ depending on the transducer in use, the installation, and the prevailing water conditions.	

Sonar channel	Range
CHIRP sonar:	0.6 m (2 ft) to 366 m (1,200 ft)
DownVision®:	0.6 m (2 ft) to 183 m (600 ft)
SideVision®:	0.6 m (2 ft) to 91 m (300 ft)
RealVision® 3D / RealVision® Max 3D:	0.6 m (2 ft) to 91 m (300 ft)

13.4 Conformance specification

Specification

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

CHAPTER 14: SPARES AND ACCESSORIES

CHAPTER CONTENTS

- 14.1 Spares — page 52
- 14.2 Accessories — page 52

14.1 Spares

The following spares are available for your product.

- **R70615** — RealVision™ 25-pin locking collar kit (Includes: 2 x Split rings (includes spare), 1 x O-ring, 1 x Locking collar and 1 x Split ring fitting tool).
- **R70867** — RealVision™ RVM-4xx mounting kit (Includes: Hull nut, Cable protector, Large internal isolator sleeve, Rubber washer, External isolator plate, High speed nose cone, 2 x anti-rotation studs, 2 x Nuts for anti-rotation studs, 2 x Small washers for Anti-rotation studs, 2 x Small internal isolator sleeves and 2 x External isolator sleeves).

14.2 Accessories

The following accessories are available for you product.

- **A80515** — RealVision™ 3D Transducer right-angled adapter cable 400 mm (15.7 in.)
- **A80475** — RealVision™ 3D Transducer extension cable 3 m (11.8 ft.)
- **A80476** — RealVision™ 3D Transducer extension cable 5 m (19.7 ft.)
- **A80477** — RealVision™ 3D Transducer extension cable 8 m (31.5 ft.)
- **A80478** — RealVision™ 3D Transducer Y-cable for connecting split pair transducers. Cable length: 0.3 m (0.98 ft.)

Appendix A Document change history

Documentation for current products is regularly updated to ensure accuracy and reflect changing product features and / or specifications. Changes made to this document since its first release are listed below.

Document number:	Document name:
87437	RVM-400-Series Installation Instructions

Changes:

Revision	Date
3	November 2025

- Updated images of “nose cone” to reflect latest version.

Changes:

Revision	Date
2	June 2023

- Technical specifications updated to include transducer frequency ranges and power output, for each sonar channel.

Changes:

Revision	Date
1	January 2023

- Initial release.

Index

A

Accessories.....	52
All-in-one.....	13
Anti-fouling.....	30, 43
Anti-fouling paint.....	30
Applicable documents.....	11

B

Box contents.....	17
-------------------	----

C

Cable	
Protection.....	32
Strain relief.....	32
Cable extension.....	15, 36
Cable length.....	19
Cable protector.....	29
Cable routing.....	34
Cables	
Split pair.....	17
Calibration	
RealVision™.....	38
CHIRP	
RealVision™ Max 3D overview.....	14
Cleaning the transducer.....	43
Compatible displays.....	14
Compatible sonar modules.....	14
Connection	
Extension cables.....	35
RVM-400.....	35
RVM-412.....	35
RVM-420.....	35
Y cable.....	35

D

Deadrise.....	13
---------------	----

Declaration of Conformity.....	8
Dimensions.....	19
Document history.....	13, 53
Documentation	
Installation instructions.....	11
Mounting template.....	11
Operation instructions.....	11, 38
Drilling holes.....	27

E

Electromagnetic Compatibility.....	24
EMC, <i>See</i> Electromagnetic Compatibility	
Extension cable.....	17

H

Hull nut.....	29
---------------	----

I

Installation	
Testing.....	26
Tools required.....	26

L

LightHouse 4.....	11
Location requirements.....	22
Locking collar kit.....	17

M

Maintenance.....	8, 43
Marine-grade sealant.....	28
Mounting.....	29
Drilling holes.....	27

N

Nut sizes.....	19
----------------	----

O

Operation instructions 11, 38

P

Parts supplied 17
Product recycling (WEEE) 9
Product support 46

R

RealVision Max 3D transducer 13
Routine checks 43

S

Service Center 46
Servicing 8
Sonar modules 14
Sonar range 14, 49
Spares 52
Split-pair 13
Support forum 47

T

Technical specification
 Environmental 49
Technical Specification
 Conformance 50
 Physical 49
 RealVision Max 49
Technical support 46–47
Temperature range 49
Tools required 26
Training courses 47
Transducer cable length 14, 19, 35
Transducer location 22
Transducer mounting 27

Transducer orientation 23
Troubleshooting 38
 Sonar 39

W

Warranty 9, 46
WEEE Directive 9
What's in the box 17

Y

Y-cable 17