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GyroPlus

Yaw Sensor

Installation Guide

Document number: 84083-1
May 2001



Important information

Safety notices

WARNING: Product installation

This equipment must be installed and operated in accordance with the instructions contained in this handbook. Failure to do so could result in poor product performance, personal injury and/or damage to your boat.

Because correct performance of the boat's steering is critical for safety, we STRONGLY RECOMMEND that an Authorized Raymarine Service Representative fits this product.

WARNING: Navigation aid

Although we have designed this product to be accurate and reliable, many factors can affect its performance. As a result, it should only be used as an aid to navigation and should never replace commonsense and navigational judgement. Always maintain a permanent watch so you can respond to situations as they develop.

EMC conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment. The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Handbook information

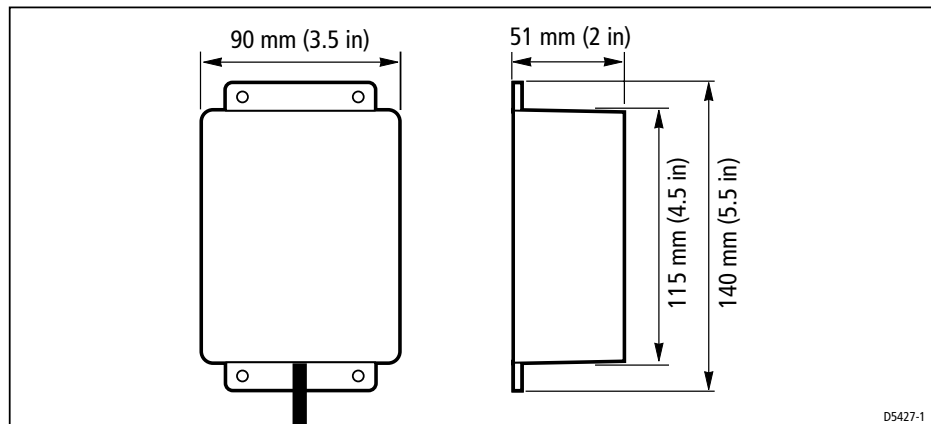
To the best of our knowledge, the information in this handbook was correct when it went to press. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and the handbook.

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Introduction

The external GyroPlus yaw sensor is an option to fit on Type 100/300 and Type 150/400 course computers. It provides the course computer with precise information about the boat's yaw (its rate of turn). The course computer uses this information to improve course keeping:

- **Type 150/400 course computers:** connecting the GyroPlus enables nine response levels, provides enhanced course keeping using AST (Advanced Steering Technology). It also allows access to AutoLearn (self-learning steering calibration) when used with ST6001+ or ST7001+ control units.
- **Type 100/300 course computers:** connecting the GyroPlus enhances performance with the autopilot set to response level 3. Autopilot operation in response levels 1 and 2 is unchanged.



GyroPlus yaw sensor - dimensions

Part supplied

The following items are supplied in the GyroPlus package:

1. GyroPlus yaw sensor
2. No 10 x $\frac{1}{2}$ inch pan-head self-tapping screws (x4)
3. Installation Guide

Tools required

To install the GyroPlus you will need:

1. Pencil and center-punch
2. Drill
3. 3.5 mm ($\frac{1}{8}$ in) drill bit
4. Cross-head/Pozi-drive screwdriver

Installing the GyroPlus

Location

Mount the GyroPlus rate sensor below deck, in a location that is:

- vertical (see below)
- dry
- protected
- free from vibration

Note: When selecting the location for the GyroPlus sensor and the route for the cable, refer to EMC (Electro-Magnetic Compatibility) information supplied with course computer.

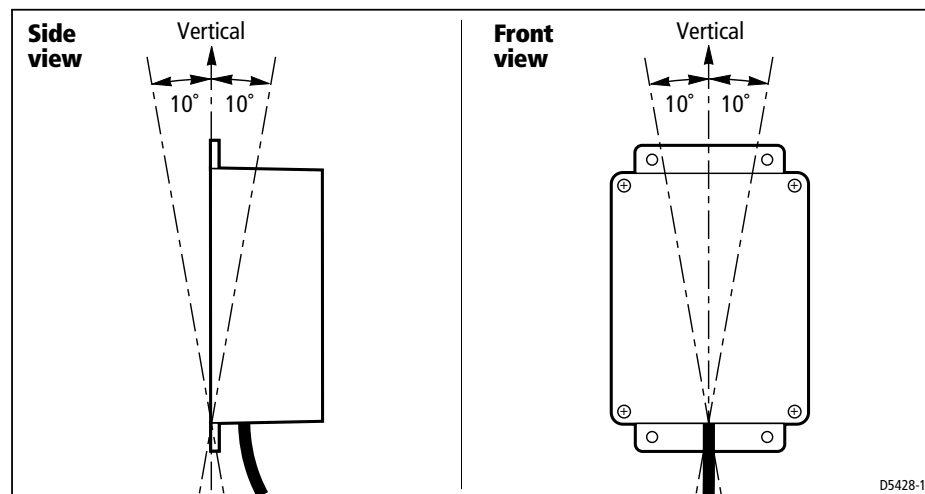
Orientation

The sensor measures the rate of turn of the boat, so it is important that you mount it vertically with the cable exiting at the bottom of the unit (as shown).

On sailboats, we also recommend mounting the GyroPlus **across the boat** on a transverse bulkhead.

CAUTION:

For the GyroPlus to work correctly, you MUST mount it within $\pm 10^\circ$ of the vertical, with the cable exiting at the base of the unit.



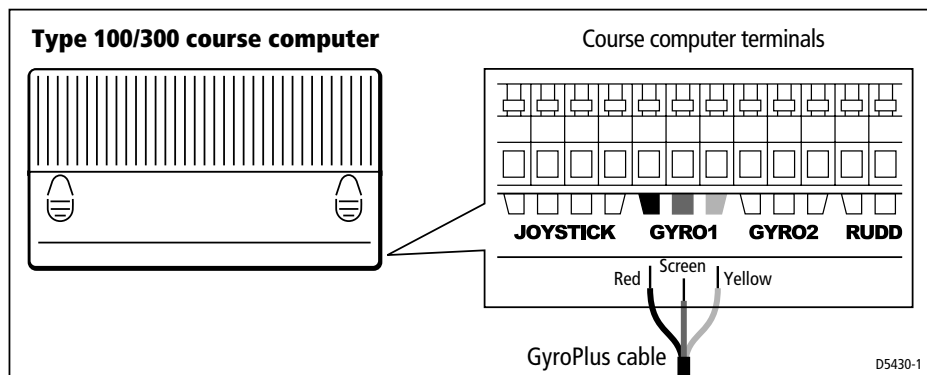
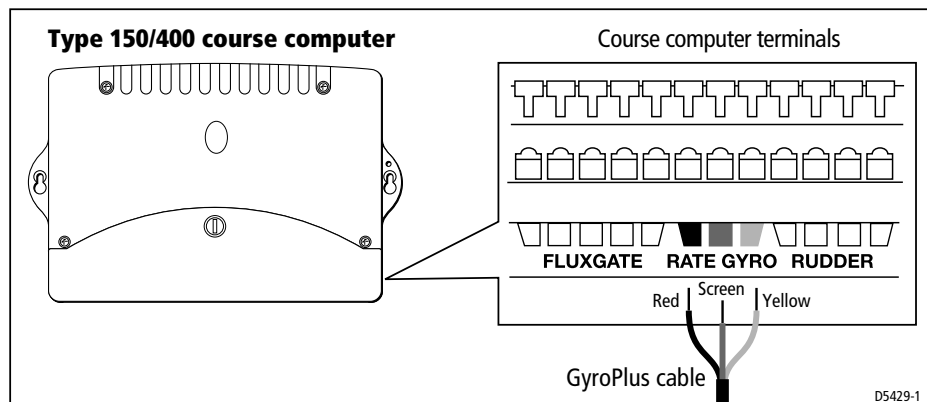
GyroPlus yaw sensor - vertical orientation

Mounting the GyroPlus sensor

1. Hold the GyroPlus in place, mark the securing holes, then remove the sensor.
2. Drill the four pilot holes using a 3.5 mm ($\frac{1}{8}$ in) drill bit.
3. Secure the sensor with the 4 screws supplied (No 10 x $\frac{1}{2}$ inch).

Connecting to the course computer

1. The GyroPlus sensor is supplied with 2 m (6.5 ft) of cable. Route this cable to the course computer.
2. Switch off the course computer power supply.
3. Connect the cores of the cable (as shown below) to:
 - the **RATE GYRO** inputs on a Type 150/400 course computer
 - or the **GYRO1** inputs on a Type 100/300 course computer
4. Switch on the course computer power supply.



Post-installation procedures

After connecting a GyroPlus sensor, you **MUST** complete these 2 procedures:

1. Offset and drift compensation
2. Course computer re-calibration

Offset and drift compensation

Like all rate gyros, the GyroPlus is subject to offset and drift. If you complete the following steps after installing the GyroPlus, your Raymarine autopilots will be able to compensate automatically for this offset and drift in Auto mode:

1. Moor the boat so the heading remains constant.
2. Press **auto** to enter Auto mode.
3. Leave the autopilot in Auto mode for 5 minutes so the course computer can determine the necessary offset and drift compensation values.
4. After 5 minutes press **standby** to return to Standby mode. The course computer will store the compensation values.

Course computer re-calibration

After installing a GyroPlus you MUST re-calibrate the autopilot. If you have an ST6001+ or ST7001+ control unit you will be able to use the AutoLearn steering calibration function.

Refer to the control unit owner's handbook for more information about calibrating the course computer.

EMC Installation & Service Guidelines

IMPORTANT NOTE

All Raymarine equipment and accessories are designed to the best industry standards for use in the leisure marine environment.

When powered up, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of electrical equipment to interact with one another, with a consequent adverse effect on operation. In order to minimise these effects and enable you to get the best possible performance from your Raymarine equipment, these guidelines are provided to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

The design and manufacture of Raymarine equipment and accessories conform to the appropriate EMC standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product. **Please keep this document for future reference.**

Safety

Some products generate high voltages, so never handle the cables/connectors when power is being supplied to the equipment.

Installation

These guidelines describe the conditions for optimum EMC performance, but it is recognised that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

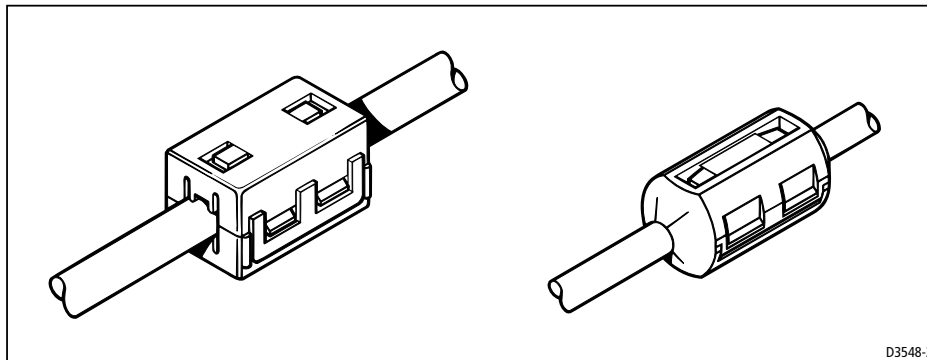
For **optimum** EMC performance, it is recommended that **wherever possible**:

- Raymarine equipment and cables connected to it are:
 - At least 1 m (3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (7 ft).
 - More than 2 m (7 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 equipment is supplied from a separate battery from that used for engine start. Voltage drops below 10 V in the power supply to our products, and starter motor transients, can cause the equipment to reset. This will not damage the equipment, but may cause the loss of some information and may change the operating mode.

- Raymarine specified cables are used at all times. Cutting and rejoining these cables can compromise EMC performance and so must be avoided unless doing so is detailed in the installation manual.
- If a suppression ferrite is attached to a cable, this ferrite should not be removed. If the ferrite needs to be removed during installation it must be reassembled in the same position.

Suppression Ferrites

The following illustration shows typical cable suppression ferrites fitted to Raymarine equipment. Always use the ferrites supplied by Raymarine.



Connections to Other Equipment

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite **MUST** always be fitted to the cable close to the Raymarine unit.

Check Before Going to Sea

Always check the installation before going to sea to make sure that it is not affected by radio transmissions, engine starting etc.

Servicing

Raymarine equipment should be serviced only by authorised Raymarine service technicians. They will ensure that service procedures and replacement parts used will not affect performance. There are no user serviceable parts in any Raymarine product.

Always report any EMC related problem to your nearest Raymarine dealer. We use such information to improve our quality standards.

In some installations it may not be possible to prevent equipment from being affected by external influences. In general this will not damage the equipment but it can lead to spurious resetting action, or momentarily may result in faulty operation.

Limited Warranty Certificate

Raymarine warrants each new Light Marine/Dealer Distributor Product to be of good materials and workmanship, and will repair or exchange any parts proven to be defective in material and workmanship under normal use for a period of 2 years/24 months from date of sale to end user, except as provided below.

Defects will be corrected by Raymarine or an authorized Raymarine dealer. Raymarine will, except as provided below, accept labor cost for a period of 2 years/24 months from the date of sale to end user. During this period, except for certain products, travel costs (auto mileage and tolls) up to 100 round trip highway miles (160 kilometres) and travel time of 2 hours, will be assumed by Raymarine only on products where proof of installation or commission by authorized service agents, can be shown.

Warranty Limitations

Raymarine Warranty policy does not apply to equipment which has been subjected to accident, abuse or misuse, shipping damage, alterations, corrosion, incorrect and/or non-authorized service, or equipment on which the serial number has been altered, mutilated or removed.

Except where Raymarine or its authorized dealer has performed the installation, it assumes no responsibility for damage incurred during installation.

This Warranty does not cover routine system checkouts or alignment/calibration, unless required by replacement of part(s) in the area being aligned.

A suitable proof of purchase, showing date, place, and serial number must be made available to Raymarine or authorized service agent at the time of request for Warranty service.

Consumable items, (such as: Chart paper, lamps, fuses, batteries, styli, stylus/drive belts, radar mixer crystals/diodes, snap-in impeller carriers, impellers, impeller bearings, and impeller shaft) are specifically excluded from this Warranty.

Magnetrons, Cathode Ray Tubes (CRT), TFT Liquid Crystal Displays (LCD) and cold cathode fluorescent lamps (CCFL), hailer horns and transducers are warranted for 1 year/12 months from date of sale. These items must be returned to a Raymarine facility.

All costs associated with transducer replacement, other than the cost of the transducer itself, are specifically excluded from this Warranty.

Overtime premium labor portion of services outside of normal working hours is not covered by this Warranty.

Travel cost allowance on certain products with a suggested retail price below \$2500.00 is not authorized. When/or if repairs are necessary, these products must be forwarded to a Raymarine facility or an authorized dealer at owner's expense will be returned via surface carrier at no cost to the owner.

Travel costs other than auto mileage, tolls and two (2) hours travel time, are specifically excluded on all products. Travel costs which are excluded from the coverage of this Warranty include but are not limited to: taxi, launch fees, aircraft rental, subsistence, customs, shipping and communication charges etc. Travel costs, mileage and time, in excess to that allowed must have prior approval in writing.

TO THE EXTENT CONSISTENT WITH STATE AND FEDERAL LAW:

(1) THIS WARRANTY IS STRICTLY LIMITED TO THE TERMS INDICATED HEREIN, AND NO OTHER WARRANTIES OR REMEDIES SHALL BE BINDING ON RAYMARINE INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(2) Raymarine shall not be liable for any incidental, consequential or special (including punitive or multiple) damages.

All Raymarine products sold or provided hereunder are merely aids to navigation. It is the responsibility of the user to exercise discretion and proper navigational skill independent of any Raymarine equipment.

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Stick barcode label here

Purchased from

Purchase date

Dealer address

Installed by

Installation date

Commissioned by

Commissioning date

Owner's name

Mailing address

This portion should be completed and retained by the owner.