

**ComNav**<sup>®</sup>

marine Ltd

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## Rudder Angle Indicator

### Installation Instructions



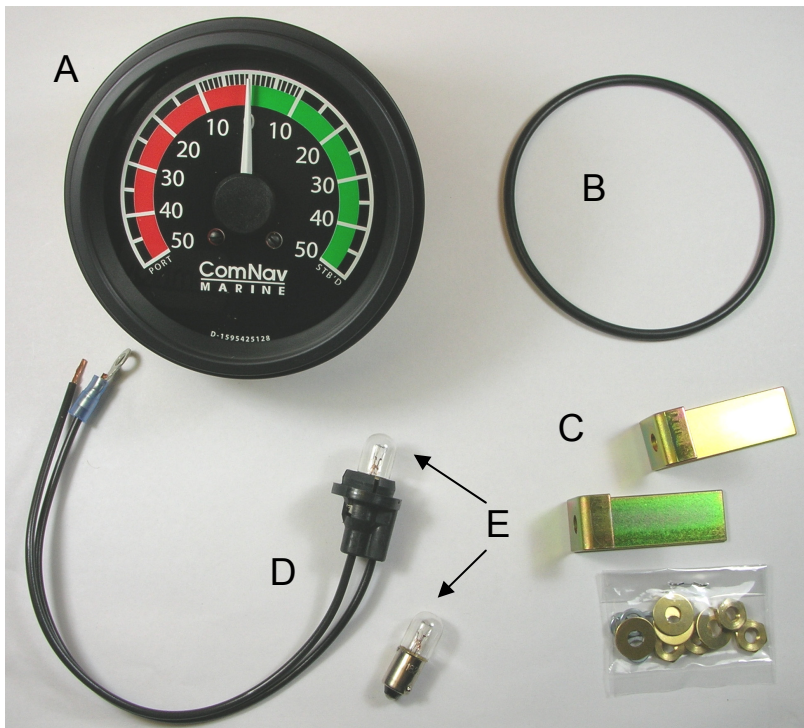
## Introduction

The ComNav Rudder Angle Indicator (PN 20360023) is a backlit 83 mm (3 ¼”) diameter gauge, which is used to display the actual position of a vessel’s rudder, when connected to the RAI output of a ComNav autopilot. It is designed to be flush mounted on any convenient flat surface at an inside or outside steering station, and has a corrosion-resistant metal backshell & a water-resistant front face. It can use a backlight supply of 12, 24 or 32 VDC, and requires ±500 µA for full deflection.

An optional Bezel Kit (PN 30360004), a Wheelhouse Case (PN 20360017) and a Watertight Case (PN 20360016) are available. The Bezel Kit & the Wheelhouse Case are for use at inside steering stations; the Watertight Case is recommended for outdoor applications if flush mounting the RAI is not possible, or when the back of the RAI may be exposed to moisture.

*Note: the plastic-backshell model RAI (PN 20360014), which was discontinued in 2008, is more or less identical to the metal-backshell model, and so can also be used with any of ComNav’s Autopilots.*

## Supplies Included



Item	Description
A	Rudder Angle Indicator
B	O-Ring (PN 65110025)
C	1 set of L-Brackets, nuts and washers
D	Bulb Socket Assembly (PN 61130007)
E*	Bulb #1818 (PN 61130001) <ul style="list-style-type: none"> <li>• used on 12V systems</li> </ul> Bulb #1828 (PN 61130002) <ul style="list-style-type: none"> <li>• used on 24V systems</li> </ul>

*\* Note: For 32V systems, the required bulb is #1835, which can be obtained from any industrial/automotive lighting supplier, or from your ComNav Dealer (PN 61130003).*

## Additional Supplies Required

You will need a suitable length of 18-22 AWG wire or cable, to connect the RAI to your autopilot’s RAI output.

## Mounting Instructions

- 1) Drill a hole on the surface you have chosen, using the dimensions of the cut-out shown below. Ensure that there is enough clearance behind the surface for the RAI.

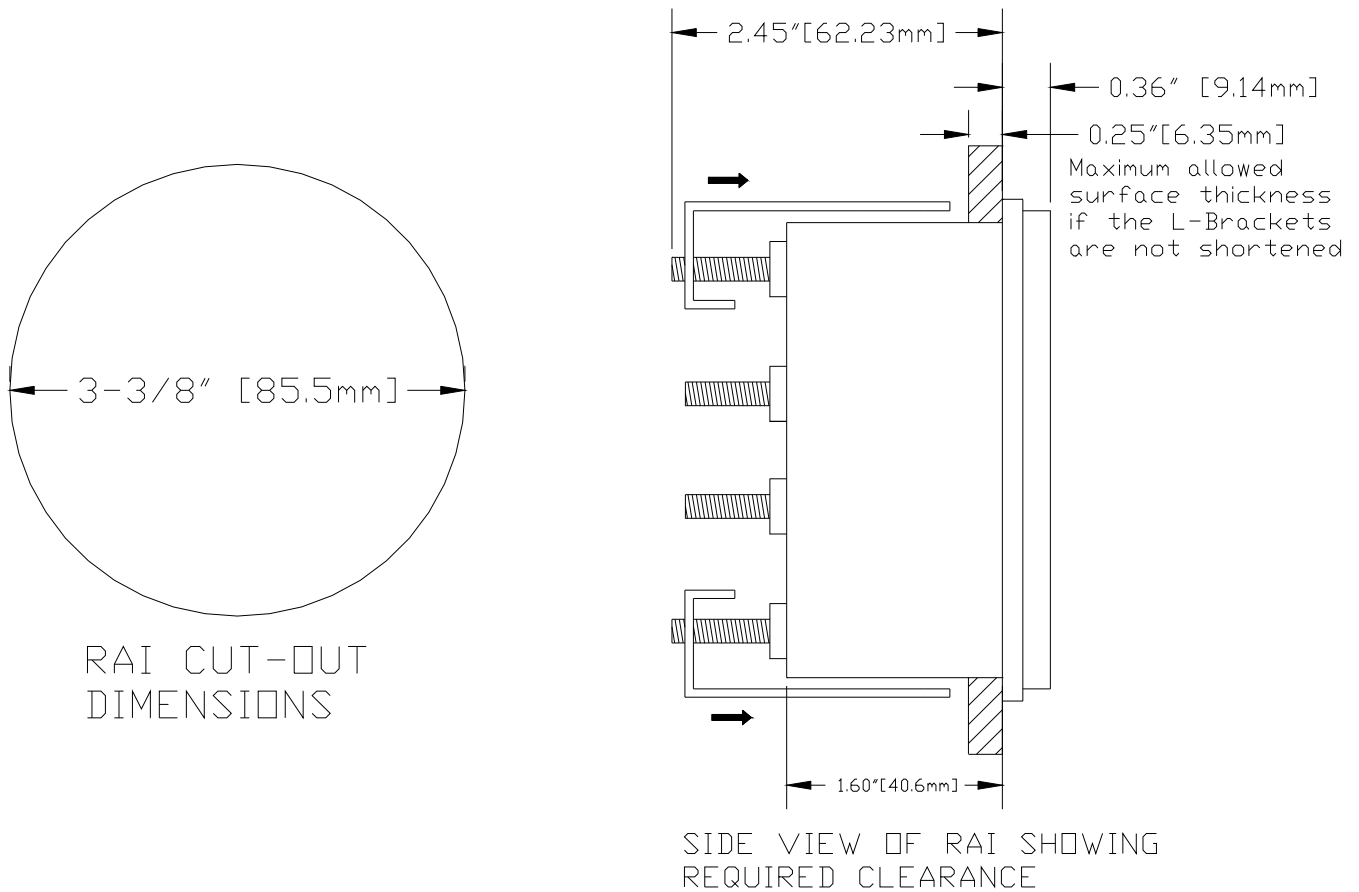
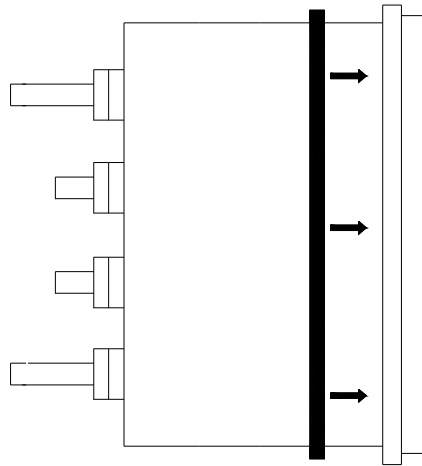


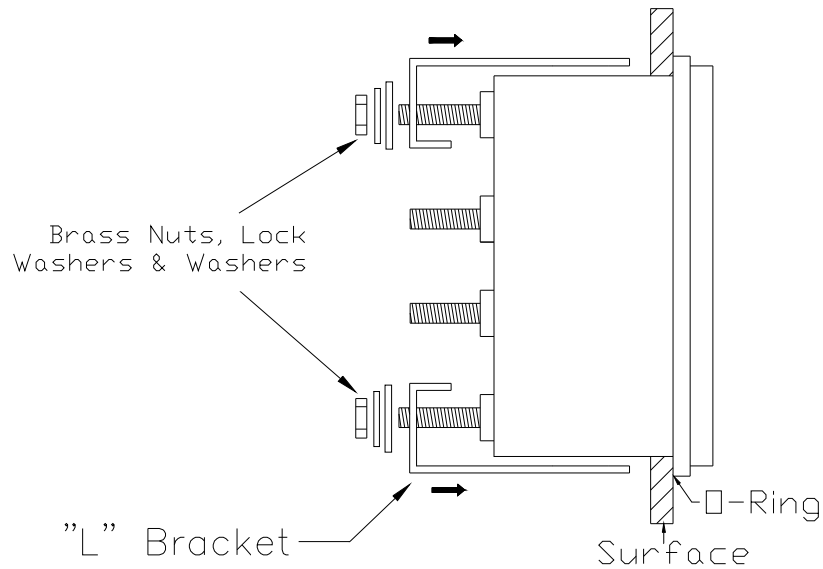
Figure 1 – RAI & Cut-out Dimensions and Required Clearance

- 2) Place the O-Ring on the RAI in the groove in the back of the unit's rim. Ensure there is no dirt or other matter in the groove.



- 3) After the RAI has been wired & tested (see the next section), mount it on the surface with the L-brackets, nuts, lock-washers and flat washers supplied.

Note that the L-brackets can accommodate surfaces up to ¼" (6.35 mm) in thickness. If the surface you are using is thicker, shorten the long legs of the brackets as required; make a clean, square cut, and de-burr the cut edges.



## Wiring Instructions

(refer to Figure 2)

- 1) Remove the meter shunt across the terminals on the back of the RAI.
- 2) Install a lamp bulb in the bulb socket; use the bulb which matches your vessel's battery voltage (12, 24 or 32 VDC). Then insert the socket assembly into the socket slot. If the socket assembly can't be pushed in easily, try tilting the assembly & "sliding" it in sideways, and/or squeeze the tangs of the assembly with a flat screwdriver or small pliers.
- 3) Connect one end of the wires/cable you have chosen to the RAI SIGNAL and RAI RETURN terminals.
- 4) Connect the other end of the wires/cable to the RAI connector on your autopilot's Processor Unit or Distribution Box.  
**ⓘ CAUTION!** *Be sure that your autopilot system is OFF before making any connections or modifications to wiring.*
- 5) Once the connections to the RAI are completed, switch ON the Autopilot and follow the RAI set-up instructions in its Installation & Operation Manual.
- 6) If the RAI's needle is moving in the opposite direction to the rudder's movement, reverse the RAI SIGNAL and RAI RETURN wire connections (with the Autopilot turned OFF). This reversal can be done either at the terminals of the RAI or at the Processor Unit or Distribution Box.

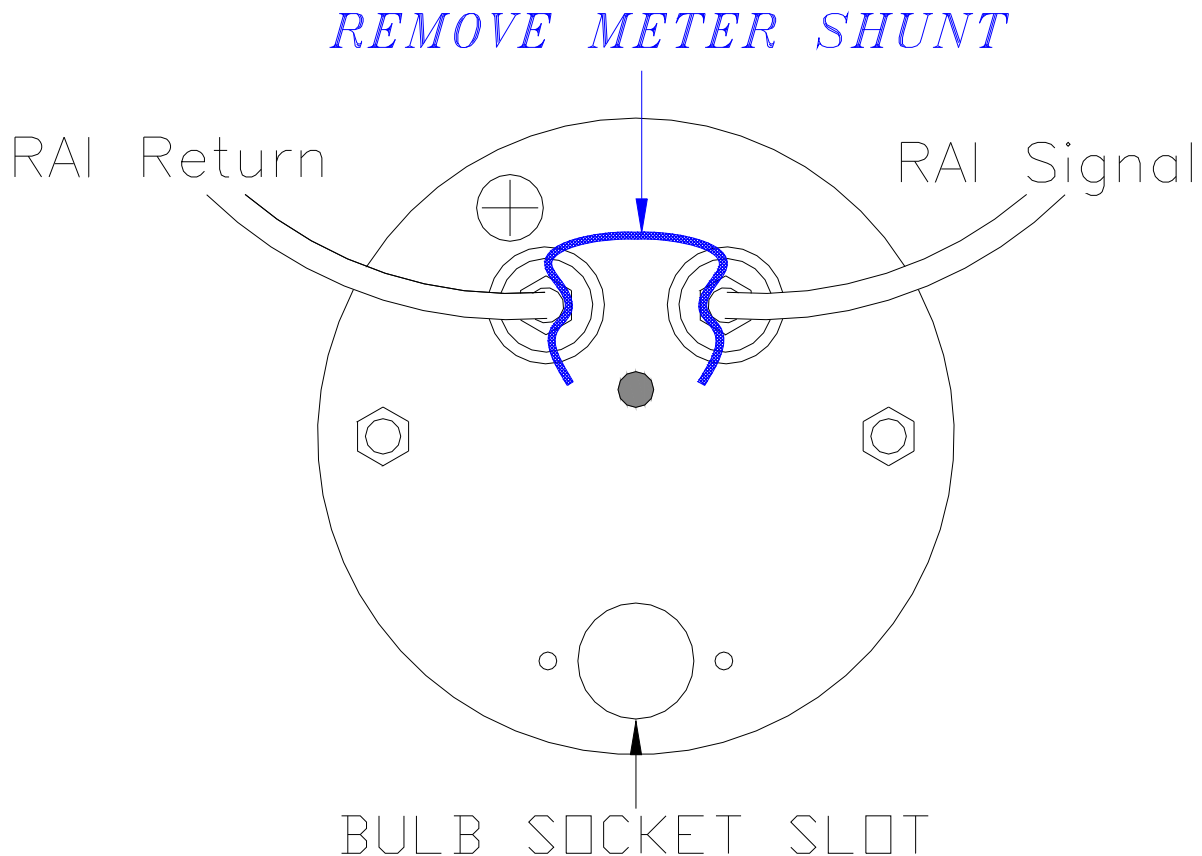


Figure 2 – RAI Wiring Diagram

## ZERO ADJUSTMENT PROCEDURE

Please read this section carefully **before** performing this procedure.

The following procedure should **ONLY** be performed by qualified personnel. Any damage to the product resulting from this procedure is the full responsibility of the owner. Please take care that no moisture, dust or foreign particles of any kind enter the RAI.

- 1) Place the RAI carefully on a clean, soft non-abrasive cloth. Remove the small red plug.



Zero adjustment  
through this hole



- 2) A light will be required to see down into the hole. Observe a small lever with a wire attached to it. By using a small dowel or screwdriver with a tapered edge, carefully slide the lever left or right, no more than the required amount to position the pointer on "0".



- 3) Reinsert the red plug, making certain that it is in the hole tightly.



Push in the red plug as far as it will go.

It must fit tightly!

- 4) Hook up the RAI temporarily to your autopilot, and test that it still functions correctly. When all is OK, reinstall it.