INSTALLATION & OPERATOR'S

# MANUAL

# HELMSMAN RTC17C

## STEERING CONTROL FOR COMNAV AUTOPILOTS

HELMSMAN

*TAKE COMMAND WITH CONFIDENCE*

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HELMSMAN

Autopilot Steering Controls & Innovative Marine Solutions

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# OVERVIEW

## 1.1 SCOPE

This manual is a reference guide for installing and operating the Helmsman RTC17C remote steering controller. Please take time to read this manual to gain a thorough understanding of the RTC17C and its relationship to a complete autopilot system.

## 1.2 COMPATIBILITY

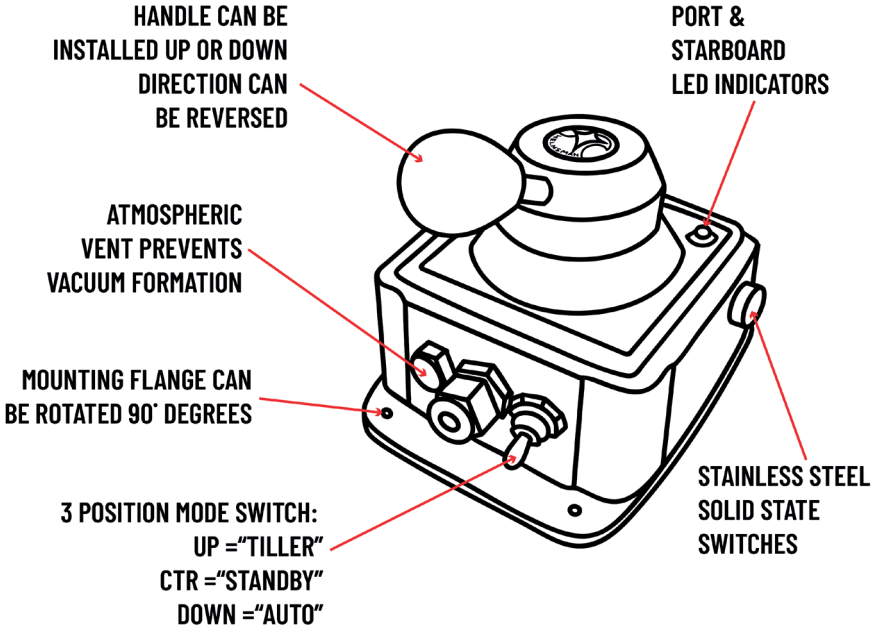
The Helmsman RTC17C is fully compatible with the following ComNav autopilot systems:

- COMNAV 2001
- COMNAV 1001
- COMNAV 1101
- COMNAV 1201

## 1.3 DESCRIPTION & FEATURES

The Helmsman RTC17C is a 'full-follow-up' remote steering controller for use with popular ComNav automatic pilots. The Helmsman RTC17C is robust, submersible, and constructed of noncorrosive materials. The RTC17C includes features that make it more reliable and versatile than original equipment.

### RTC17C KEY FEATURES:




## OPERATION

### 2.1 TAKING COMMAND

To take command from the RTC17C, the operator presses the port and starboard buttons simultaneously. The port and starboard LED indicators will illuminate momentarily. Once the RTC17C is in command, the user can then use the toggle switch to select one of the tree operating modes: TILLER, STANDBY, OR AUTO.

## 2.2 MODE SELECTION

Moving the toggle-switch up engages TILLER mode giving the operator direct command of the ship's rudder. While in TILLER mode the autopilot behaves like a servo, keeping the ships rudder position in agreement with the RTC17C's lever position. This mode is most often used when docking or maneuvering the vessel.

Moving the toggle switch to the middle position places the autopilot in STANDBY mode, this leaves the RTC17C in command, but in a safe, passive, state in which the lever, or push-buttons have no effect. STANDBY would be selected when, for example, the operator wants to leave the steering station inactive while hauling fishing gear aboard the vessel.

When the toggle switch is moved to the down position AUTO mode is selected. The autopilot will keep the current heading. For example, the operator can use TILLER mode to steer the vessel on a desired course then maintain that course by moving the toggle-switch back to AUTO. While in AUTO mode the operator can also make 1 degree course adjustments by pressing the port, or starboard pushbuttons. The corresponding LED indicator will illuminate momentarily.

### 2.3 RETURNING COMMAND TO THE CONTROL UNIT

The ComNav autopilot control unit can take command from the Helmsman RTC17C at any time, by pressing the port and starboard buttons on the Autopilot control unit. Refer to the ComNav Marine operator's manual for details specific to each model.

## CONFIGURATION & INSTALLATION

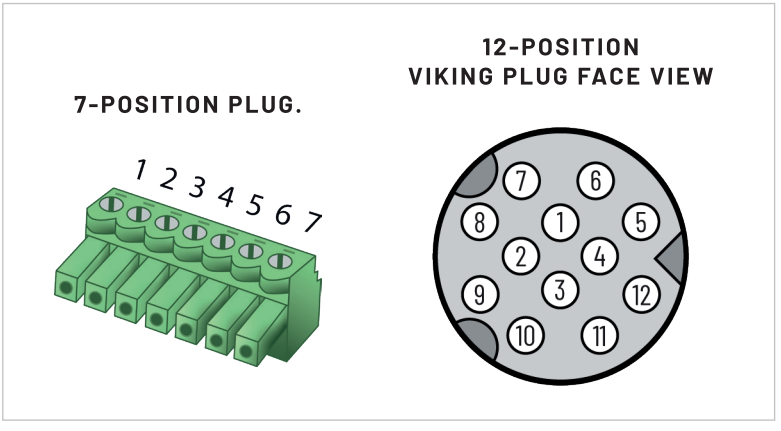
### 3.1 WIRING CONNECTIONS

The RTC17C is typically attached to an existing ComNav, neoprene jacketed cable. If an alternative cable will be used, the installer should verify that it is in good condition and that there are no punctures in the outer jacket. Even though the Helmsman RTC17C is pressure balanced to prevent vacuum formation, water will always seek the lowest point. Other cable types can be used provided that the cable is shielded, waterproof, and within the diameter range specified for the cord grip.

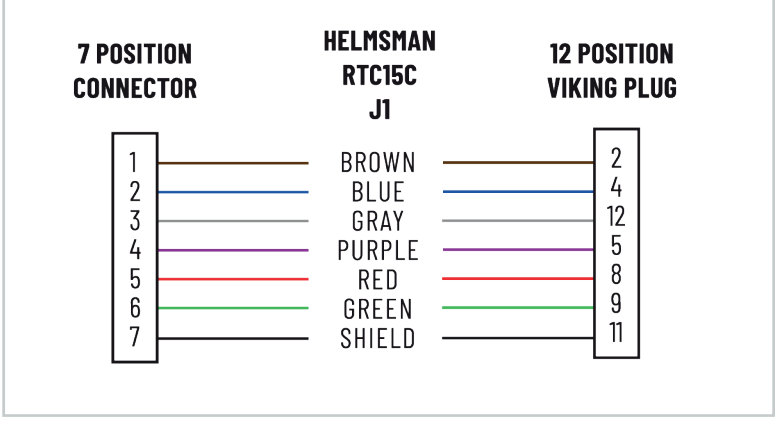
> *NOTE: Some alternative cables would include Belden 9932 (Seven 24 AWG conductors), Belden 9943 (Seven 22 AWG conductors) and Belden 9612 (Seven 24 AWG conductors).*

The Helmsman RTC17 has a liquid-tight cord grip that is rated IP68. The cord grip will accommodate cables having outside diameter between 0.16" to 0.30" (4mm to 8mm) . The compression nut must be secured to provide strain relief and full sealing integrity.

- Remove the back cover using a #1 Philips screwdriver.
- Open the enclosure and remove the 7-position plug. The terminals are numbered 1 - 7 as shown.



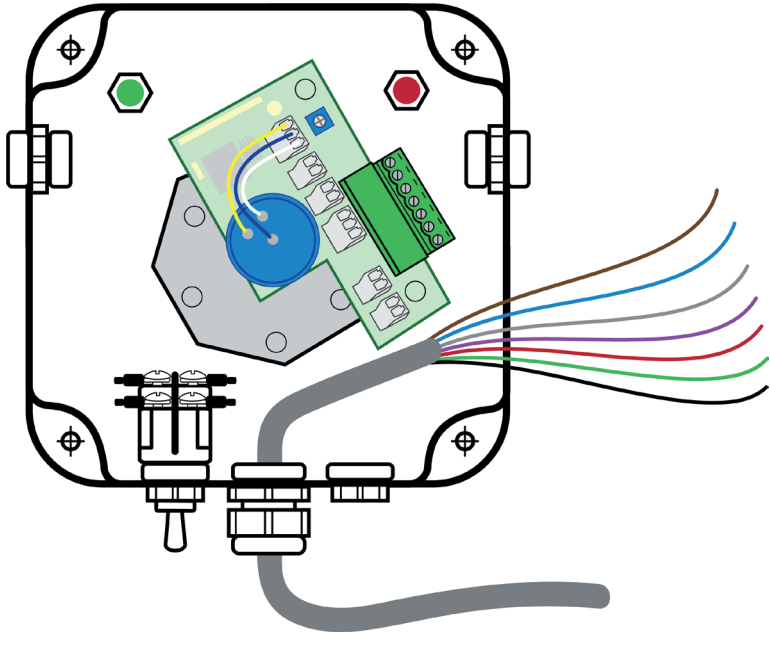

The following wiring diagram shows a standard ComNav cable with a 12-pin connector plug as connected to the Helmsman 7 position plug.




**COMNAV CABLE WIRING DIAGRAM**

• Loosen the cord-grip *(cable seal)* to allow free insertion of the multi-conductor cable and pass the cable through the cord-grip.

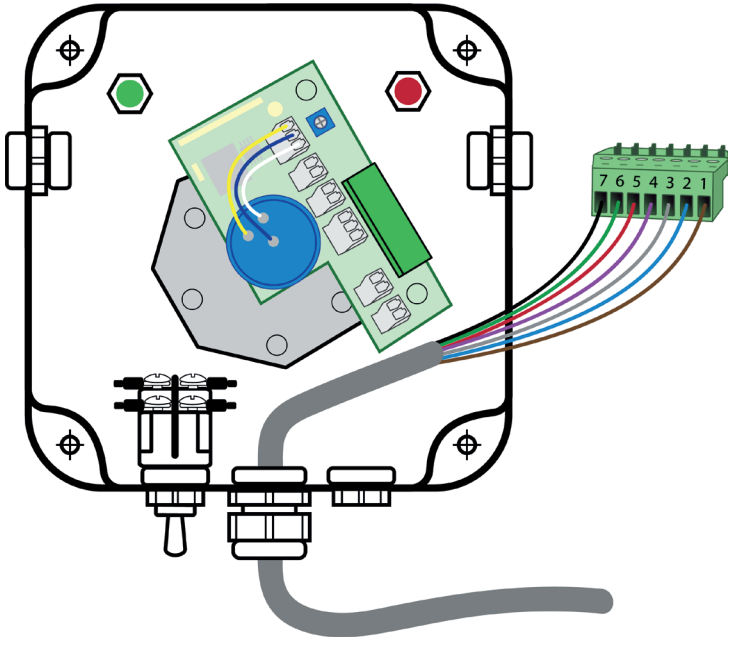
• Feed the cable through the cable-seal (cord-grip) and remove 5 to 6 inches of the outer insulation.



• Separate the shield and needed wires then strip off ¼" of insulation from each wire. The shield wire should be insulated with sleeving or e-tape.

• Secure each wire in its corresponding contact position as illustrated.

*NOTE: Be sure to inspect for stray conductors and tug each wire slightly to ensure that connections are secure.*




• Reinsert the 7-position plug in the socket and replace the back cover (see illustration on next page).

*NOTE: Before replacing the cover inspect the perimeter gasket to ascertain that there is no debris on the gasket which may compromise sealing integrity.*

*NOTE: Tighten fasteners just enough to evenly compress the silicone gasket. Excessive force can damage the threaded inserts.*

## 3.2 MOUNTING OPTIONS

The RTC17C features a mounting flange which can be rotated 90 degrees to suit customer preference. Use a #1 Phillips screwdriver to remove the back cover, rotate the base flange and reinstall the back cover. *(Refer to the diagrams section of this document for visual guidance.)*

> *NOTE: Before replacing the cover inspect the perimeter gasket to ascertain that there is no debris on the gasket which may compromise sealing integrity.*
>
> *NOTE: Tighten fasteners just enough to evenly compress the silicone gasket. Excessive force can damage the threaded inserts.*

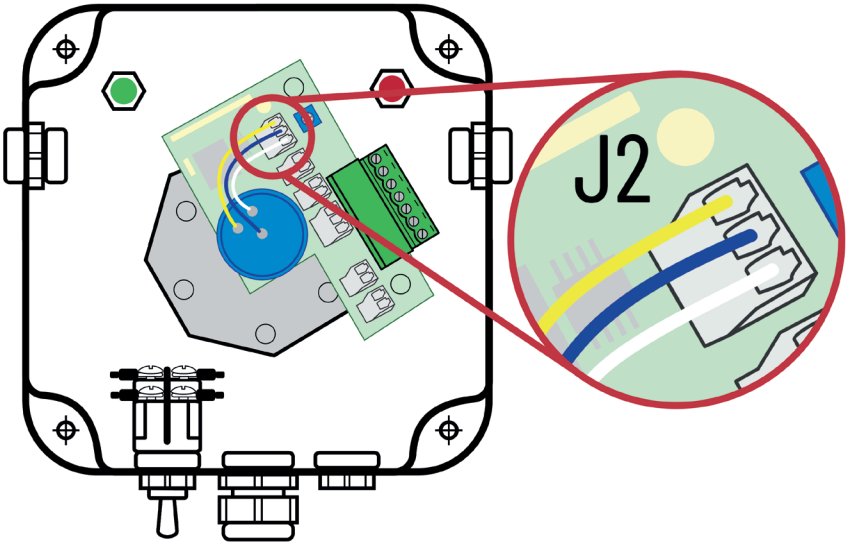
## 3.3 HANDLE POSITIONING

The RTC17C control handle has a 5/16-18 threaded shank that can be installed in two locations on the hub. A plastic hole-plug *(included in the fastener kit)* should be pressed into the unused hole to protect the threads. *(Refer to the Diagrams section of this document for visual guidance.)*

## 3.4 HANDLE ACTION

Clockwise rotation of the hub will typically result in port rudder direction, but in some installations, it may be preferable to have the rudder travel the opposite direction. The action of the control handle is reversible to suit operator preference.

To reverse the control handle's action, remove the back cover and reverse the potentiometer connector (J2) as shown in the following illustration.




*NOTE: Before replacing the cover inspect the perimeter gasket to ascertain that there is no debris on the gasket which may compromise sealing integrity.*

*NOTE: Do not over tighten the fasteners. Tighten enough to evenly compress the gasket. Excessive force can cause damage to the threaded inserts.*

## 3.5 DOCKSIDE TESTS

After connecting the Helmsman RTC17C, it is essential that the installer test the autopilot system to verify correct operation.

- Apply power to the ComNav autopilot system and select "Power Steer" on the control unit. Make sure the rudder-drive system is active.
  Set the RTC17C mode switch to the middle (STANDBY) position

- Press and hold the port and starboard pushbutton switches simultaneously both LED indicators will illuminate momentarily and confirm that the RTC17C is in command.

- Set the RTC17C mode switch to the up TILLER mode position then Move the steering lever full port (or full starboard) and confirm that the rudder moves in the proper direction. If the direction of rudder travel is opposite to than expected, then reverse the RTC17C's potentiometer connector as explained previously in 3.4

- Return the steering lever to mid-ship position to confirm that the rudder stops at midship position. IF the rudder does not stop in midship position then an offset adjustment might be required, as explained in section 3.6

- Set the RTC17C mode switch to the down AUTO mode position. Again, confirm the mode change indication on the ComNav display.

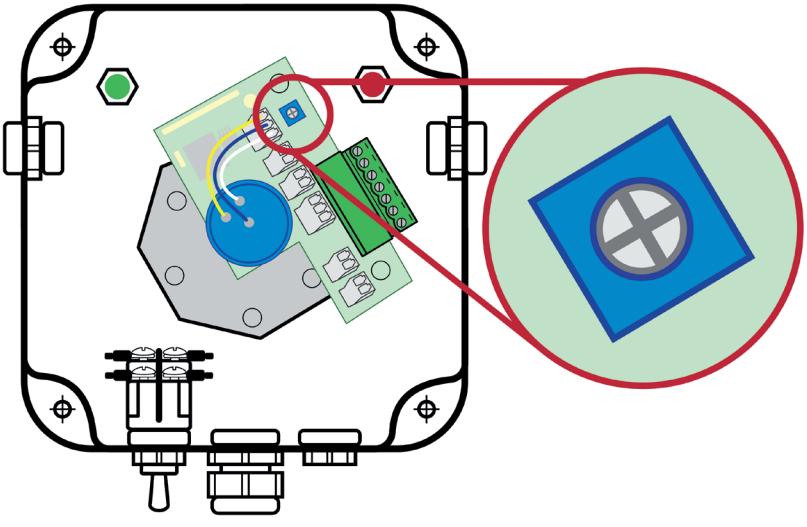
- While in AUTO mode, press the port pushbutton on the Helmsman RTC17C and confirm that the rudder moves one degree to port. Repeat, using the starboard button.

- Take command from the ComNav control unit by pressing the port and starboard key buttons on the ComNav control panel. Confirm that the RTC17C is decommissioned.

## 3.6 ADJUSTMENTS

In some installations the rudder midship position might not correspond exactly with the midship position of the RTC17C. This slight rudder offset is usually caused by the autopilots rudder sensor not being well centered during its original installation. The RTC17C includes an offset trim adjustment to correct for rudder misalignment. The trimmer can correct for 5 degrees of rudder error.

*(See trim adjustment location illustration on the next page).*



## RUDDER OFFSET TRIMMER

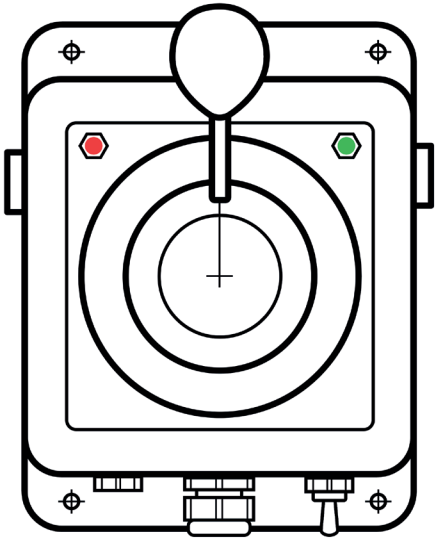
If the autopilot has a rudder angel indicator meter the trim adjustment can be done at dockside.  If no rudder angle indicator is installed then the offset trim adjustment should be performed during sea-trial.

To make an offset trim adjustment on sea-trail, simply put the RTC17C in TILLER mode, position the steering lever in the midship position, and adjust the offset trimmer until the vessel is holding a straight course.  Be sure that there are no cross-currents that would affects the vessels course while making offset trim adjustments.

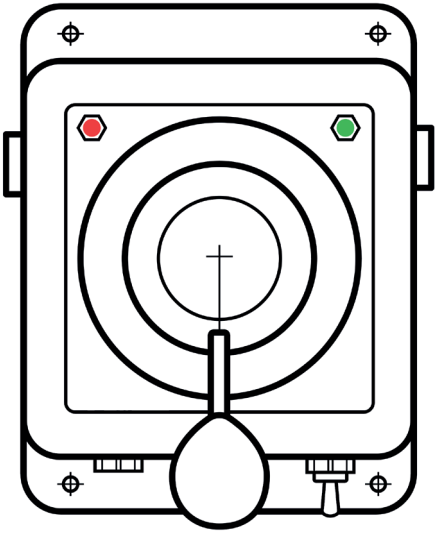
# DIAGRAMS & DIMENSIONS

## 4.1 HANDLE POSITIONS

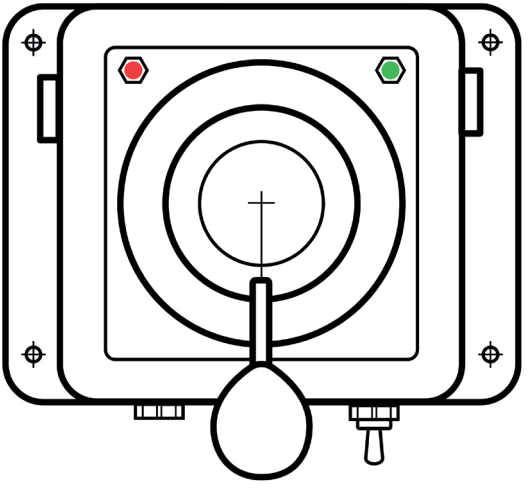
HANDLE UP



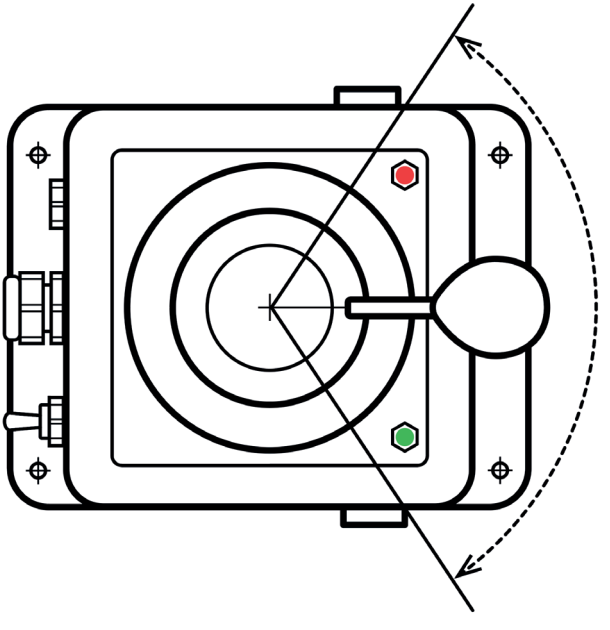
HANDLE DOWN



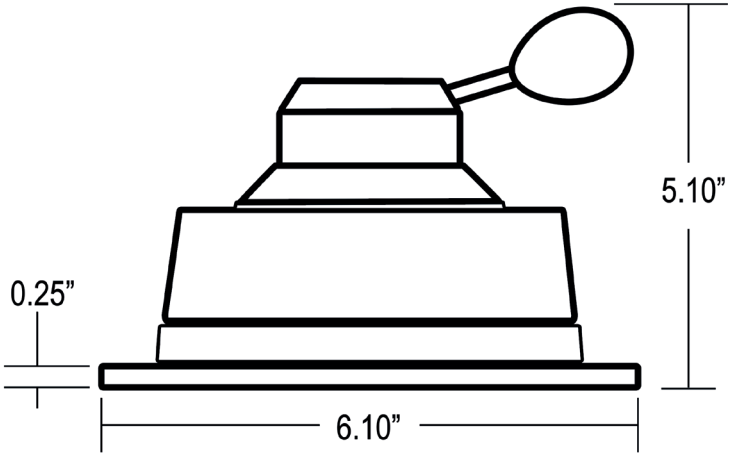
## 4.2 MOUNTING FLANGE ORIENTATION

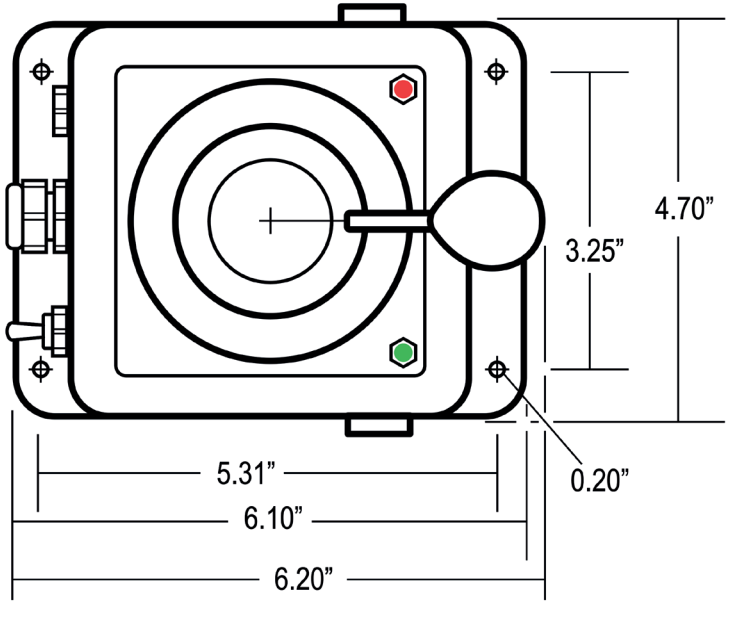


THE MOUNTING FLANGE CAN BE INSTALLED HORIZONTALLY OR VERTICALLY



## 4.3 DIMENSIONS



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