



RUDDER SPEED

To achieve optimum autopilot system performance. Speed of rudder correction is the most important feature to control. Too slow or too fast can result in poor steering performance and higher power consumption.

As a guide, 12-15 seconds HO-HO measured at dockside is considered nominal speed for autopilot performance. A light fast racing vessel will benefit from a faster rudder speed and a heavy slow cruising vessel will perform well with a slower rudder speed.

MECHANICAL STEERING

Mechanical manual steering systems. These systems are sometimes called “pull-pull cable” or “cable and chain”.

A common autopilot drive unit that attaches to this type of steering system consists of the following components: hydraulic pump (driven by a dc motor) – steering cylinder – hydraulic reservoir – bypass valve.

A similar system is available from other manufacturers based on mechanical components. They consist of a dc motor – reduction gearbox – clutch mechanism – ball screw actuator.

These types of drive units are actually independent steering systems that attached to the rudder post. They “free flow” when the manual system is in use and are “locked” onto the steering system when the bypass valve or clutch are operated. Autopilot electronics control the “free flow or locked” state.

Autopilot manufacturers use different methods of determining the required size of the autopilot drive system. One approach is to calculate rudder loading based on hull and rudder style and vessel weight, speed sailing type (eg. day trip – coastal – blue water). Another approach is to use vessel length and sailing type as a guide.

Selecting a “bigger drive unit” or running the HO-HO too fast can result in higher power consumption with corresponding shorter battery life.

Selecting a “smaller drive unit” can result in higher power consumption, shorter battery life and shorter life of the drive unit and the autopilot electronics.



HYDRAULIC STEERING

Hydraulic manual steering systems. These systems have a helm pump and a hydraulic steering cylinder. Larger vessels may have multiple helm pumps.

The common autopilot drive unit that attaches to this type of steering system consists of a hydraulic pump driven by a dc electric motor. The pump is hydraulically plumbed into the manual steering system.

Hydraulic steering systems on sailboats may not have lock out valves fitted. It will be necessary to fit lock out valves when fitting an autopilot drive to these systems.

Autopilot manufacturers usually determine the required size of the autopilot drive by specifying the required HO-HO speed. The size and type of vessel are taken into account when establishing this number.

The volume of the steering cylinder is required to determine the corresponding size of the autopilot drive pump.

The type of vessel and usage is also taken into consideration when determining the type of drive pump.

Smaller pleasure vessels often use a reversing pump, this type of pump is best for minimal power consumption.

Larger vessels often use a continuous running pump, this type of pump is best for durability.