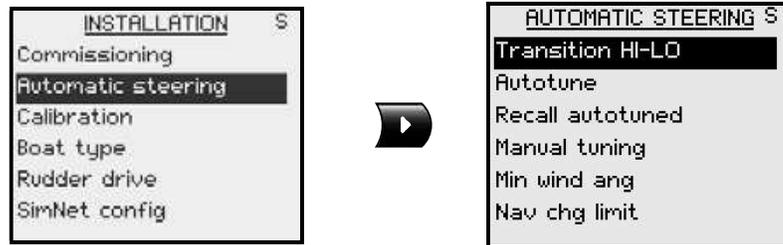


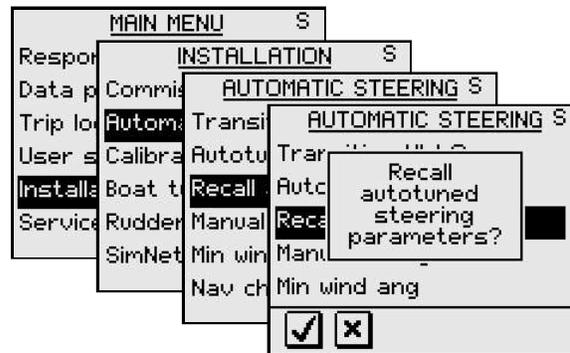
Automatic steering

The Automatic steering menu contains steering parameters for course steering, wind steering and nav steering.



Recall autotuned

To recall the parameter values that were achieved during the *Autotune* procedure, select *Recall autotuned* under 'Automatic Steering', and press the  key.

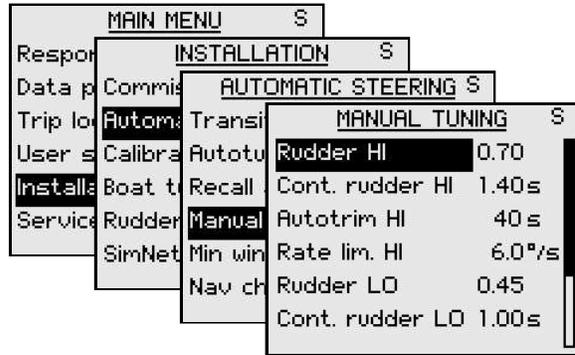


Confirm by pressing the  softkey.

Manual tuning

The steering parameters can be looked at and changed if needed under this menu item. The parameters are divided into two sets (page 17):

- HI value parameters for automatic steering at low speed and when running with a sailboat
- LO value parameters for automatic steering at high speed and when sailing into the wind or reaching with a sailboat



The 'Manual tuning' screen can also be reached from the Auto mode main screen by pressing the **MENU** key followed by the **AUTO** key within 2 seconds.

Confirm by pressing the softkey.

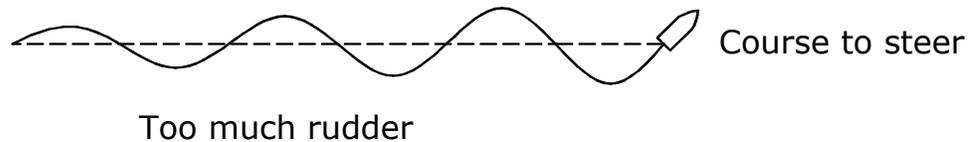
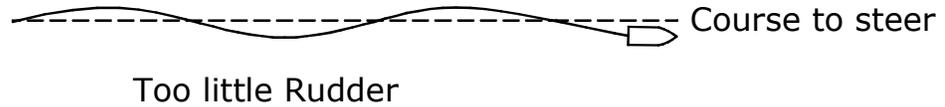
Displayed parameter	Boat type		Own boat	
	Displacem. & Sail	Planing & Outboard	Autotune	Manual
Rudder HI	0.50	0.30		
Cont.Rudder HI	1.40	1.40		
Autotrim HI	40 sec.	40 sec.		
Rate Lim HI	6.0°	6.0°		
Rudder LO	0.35	0.20		
Cont.Rudder LO	1.00	1.00		
Autotrim LO	40 sec.	40 sec.		
Rate Lim LO	6.0°	6.0°		
Minimum rudder	Off	Off		



The values in the table are factory set (default) and listed for information only. After having performed the Autotune, the values may differ from those listed in the table. See also "Autotune" previously in this chapter.

The two most important parameters that determine the performance of the automatic steering are *Rudder* and *Counter Rudder*.

Rudder sets the rudder gain which is the ratio between the commanded angle and the heading error.



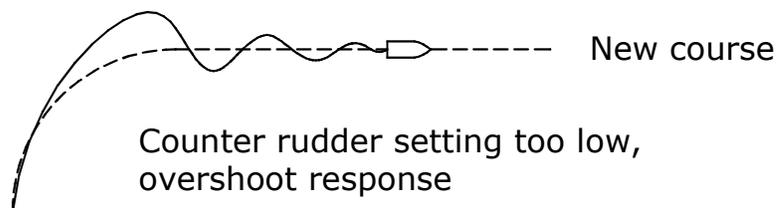
- Too little Rudder and the autopilot fails to keep a steady course
- Too much Rudder gives unstable steering and reduces speed
- Low speed requires more rudder than high speed

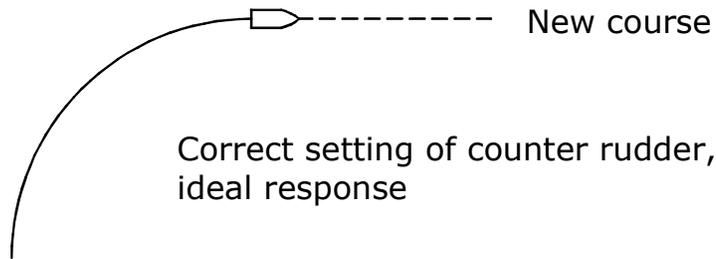
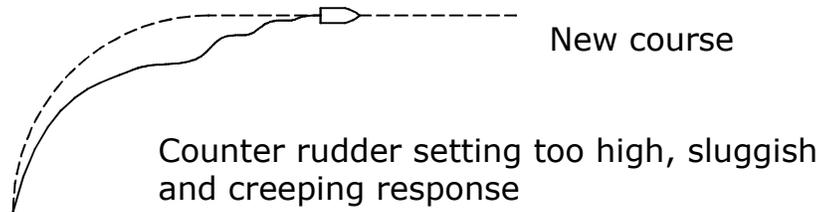


See also "Minimum Rudder" on page 89.

Counter Rudder is the parameter that counteracts the effect of the boat's turn rate and inertia. For a short time period it is superimposed on the proportional rudder response caused by the heading error. It may sometimes appear as if it tends to make the rudder move to the wrong side (counter rudder).

The best way of checking the value of the Counter Rudder setting is when making turns. The figures illustrate the effects of various Counter Rudder settings.





Autotrim standard value is 40 seconds which should work well on most boats.

Rule of thumb: Set to same value (seconds) as the boat's length in feet.



On boats operating on VRF it should be set to 20 seconds

Rate Limit should be kept at 6.0°/second unless there is a need for more rapid response in turns.

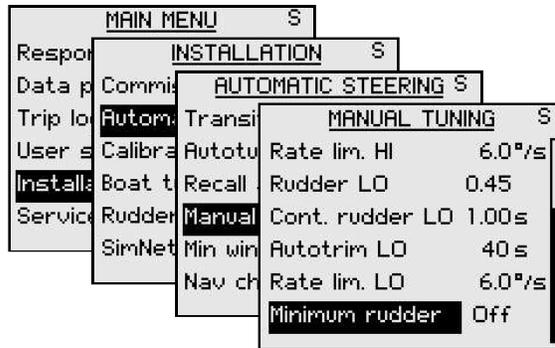
Minimum rudder

Some boats may have a tendency of not responding to small rudder commands around the "course keeping" position because of a small rudder, a rudder deadband, whirls/disturbance of the water-stream passing the rudder or it is a single nozzle water jet boat.

Turning the Minimum Rudder function 'On', may improve the course keeping performance on some boats, but will increase the rudder activity.



During the seatrial, only set Minimum Rudder to ON if it proves to give a better course keeping performance in calm sea. It should be set after the Autotune has been performed and a possible fine tune of the Rudder parameter (page 88).



Range	Change per step	Default	Units
OFF - 5	0.1	OFF	°

Final seatrial

After having completed all settings in the Installation Menu, take the boat out and perform a final seatrial in open waters at a safe distance from other traffic.

- Steer the boat on all cardinal headings in AUTO mode
- Start with low and medium speeds to get familiar with the response from the AP28
- Verify the HI/LO transition and the effect of LO and HI parameter settings (page 13)
- Try the effect of the Response adjust (page 15)
- Try the U-turn function
- If a Non Follow-up lever (or handheld remote) is connected, test change of modes and verify port and starboard steering commands of the lever
- Set waypoints into each navigator connected to the system, and verify that the AP28 steers in NAV mode for each NAV source
- Try the NoDrift mode
- If the boat is a sailboat use the WIND mode and try the AP28 at different settings of the apparent wind angle. Also try the WINDN(av) mode, optimized VMG and WCV when sailing (tacking) to a waypoint
- If the rudder response feels aggressive during the seatrial, you may want to reduce the rudder speed to

get a smoother steering. Alternatively on a sailboat you may want to have a higher rudder speed when running

- The motor Drive out (page 92) can be set with the above in mind. Never adjust in more than 10% steps with respect to the reading set during the automatic rudder test (page 70). Always perform a new Autotune after the adjustment
- Provide the owner with user training

Providing user training

The user should be instructed in the "basic" operational functions, such as:

- Turning the system on and off
- Changing modes. Explain briefly what takes place in the different modes
- Regaining manual control from any mode. Point out in what modes the helm is engaged by the autopilot
- Taking command at an "inactive" station, if applicable
- Using the lock mode, how to lock/unlock and how to shut the system down from a locked control unit, if applicable
- Use of the Power steering mode (NFU)
- Use of a Non Follow-up controller, if connected
- Changing course by rotary knob and keys
- Stepping through the Main menu and sub menus learning how to (and why to) change the settings
- How to select alternative sources for heading (compass), navigation (GPS), chart plotter, speed, depth etc. if available
- Understand the difference between NAV mode and NoDrift mode and their data sources (Nav, Pos)
- Locating compasses and knowing to keep magnetic items away
- Locating the Mains circuit breaker and the separate SimNet circuit breaker if provided