

# Wind vane design by

[www.windvaneselfsteering.co.uk](http://www.windvaneselfsteering.co.uk)

A wind vane must be sensitive to apparent changes in wind direction but also bring the boat back on course relative to the wind under control without over-steering . This is done by the vane.

A vane that is mounted on a horizontal axis will deflect up to its maximum (which could be as much as 90 degrees if not restrained) the moment the boat goes off course even by only one degree. It is therefore very sensitive to changes in wind direction but violent on the tiller with the pendulum swinging to its maximum one way and then the other as it over-steers. This was the experience of early “horizontal” wind vanes until the problem was solved by the engineer Marcel Gianoli.

A vane on an axis that is inclined to the horizontal from anything up to 90 degrees (ie vertical) feathers into wind when the boat is off course. This limits vane deflection and consequential swing of the pendulum by the degree the boat is off course, so steering is controlled. Marcel Gianoli discovered that the best compromise between sensitivity and control is a vane axis inclined 20 degrees to the horizon, adopted now by “horizontal” wind vanes.

The vane axis of a Hebridean by contrast is horizontal (it only becomes inclined when the boat heels) so the vane does not feather itself into wind as others do when they deflect.

As the pendulum swings, it rotates the vane axis into wind. This feathers the vane and damps vane deflection. With the boat correcting course, the vane flips with wind on its other side, the pendulum counter-rotates and swings back leaving the boat on course with tiller central, in line. This feed-back from pendulum swing gives the Hebridean the control all wind vanes need to safely and steadily steer a boat without sacrificing the sensitivity and power of a vane on a horizontal axis, good for running with the wind in heavy seas.

DIY construction of a vane on an axis that is not inclined is also easier.