Retractable Propulsion System: this efficient propulsion train is extended from the hull within 35 seconds and at hull speeds of up to 14.5 knots; flaps seal the aperture. Likely to become standard kit for racers.

NO DRAG

The Ship Motion Group's highly efficient retractable propulsion system makes sail-yachts faster. The first units have already been installed.

Text Martin Hager

Small margins can occasionally make all the difference between winning and losing, especially during regattas. The right gust at the right time, the best course, and of course material details too. That is all the more explicit the more that yacht performance and performance of professional crews – now too an integral part of the maxi-yacht community - converge. Yacht classes, like the Wally Cento or J-Class, emphasise the point: sailing-mad owners love seriously competitive racing, where what mainly counts are the crew's skills rather than the materials used. The victory champagne tastes even better if that's the case.

Of course that's not to say that builders don't try to squeeze every last gramme out during construction of these yachts, designed both for blue-water family cruises and for racing. "And there's more to it than just that", says Jan Bruggeman, who is responsible for developing this in-hull retractable propulsion package at the Dutch company, Ship Motion Group. "By fully retracting the propulsion train, including shaft, shaft strut and propeller„ hydraulically into the hull, we can reduce drag by between four and ten percent, depending on conditions." At lower wind speeds and therefore lower hull speeds the reduction in drag is greater. The yacht accelerates and sails noticeably quicker than one with a fixed-position folding propeller.

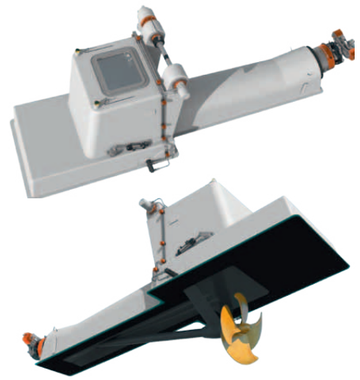
PHOTO: JEFF BROWN

The second performance yacht to feature the RPS is the 33-metre Baltic, "WinWin"

Now that sail and rig innovations and weight savings all the way up to the masthead have seemingly exhausted most options for getting yet more enhanced performance out of sailing yachts, attention is now being turned to potential below the waterline. "We offer, so to speak, a 100% effective supplement to the long-standard CFD analyses and test tank experiments that naval architects and yacht designers use to optimise hull lines and appendages", says Jan Bruggeman. The performance potential is massive.

The Dutch firm's debut references include the nearly 45-metre supermaxi "Visione", which SAP founder Hasso Plattner has sailed competitively in superyacht regattas since 2006. Yet even Plattner had to concede that the competition is getting stiffer and stiffer and that increasingly faster yachts want to be amongst the frontrunners every time. Besides modifications to his rig and sails, the software mogul then opted in 2012 to have the Dutch firm's Retractable Propulsion System, RPS for short, installed. "The difficulty was that 'Visione' already had a given layout and we had to integrate the system into the available space", Ship Motion's founder Bruggeman recounts. In addition to reducing drag the Dutch firm made every effort from the very beginning to design-engineer the DNV classification rules-compliant system to be as light and efficient as possible. In addition to carbon fibre the Dutch firm also opted to use the high-strength light metal, titanium, of which even the propeller was made, for "Visione's" RPS at the owner's request – a massive engineering effort and financial outlay. In order to optimise propeller incident flow, Ship Motion's engineers also resorted to using CFD software. "The greater degree of efficiency achieved enables us to downsize engines, which in turn achieves a significant reduction in weight and therefore delivers even better performance", says Bruggeman. The Ship Motion Group provides the full RPS system, including control unit. It takes 35 seconds for the propulsion train to be extended from the hull and for the aperture to be closed. The shaft, including propeller, extends at hull speeds of up to 14.5 knots, and according to the specification the unit can be retracted into the hull at speeds of up to 19.5 knots. And in the event of a hydraulics failure, a manual system provides a remedy.

The recently launched 33-metre Baltic 108, "WinWin", is the second yacht to sport an RPS. The Ship Motion team was involved from the very beginning in the project to build this fast Javier Jaudenes design and was able to develop a standard product, which it now provides in different sizes for engines ranging from 325 to 750 kilowatts output. That makes these propulsion units an interesting proposition for yachts with LOAs starting at 28 metres.



Baltic 108 "WinWin": the Ship Motion Group supplied its full RPS system with a wetbox housing propeller, shaft and shaft strut. A window panel provides an inside view.