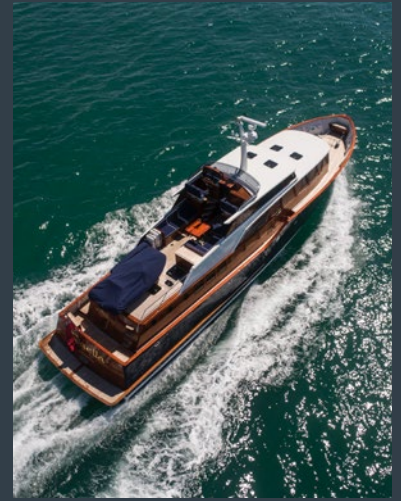


Spirit P70 – a Vision of Efficiency

Spirit Yachts' builds are always a fabulous blend of classic looking wooden hulls with a subversive twist – lightweight hull construction and energy efficient, low emission technologies on board. The P70 is no exception, a vessel designed to deliver on all levels.

Following previous collaborations, Spirit Yachts contacted us to help them build an electrical system for the P70 build that would meet the specific brief of the owner, who wanted enough range to be able to transit from the South of the UK to the Baltic at pace (18 knots) with only 10,000 litres of fuel capacity.

Part of the equation for Spirit in meeting this brief was a super light hull – requiring less power and therefore lower fuel consumption. But making a super light hull and then filling the boat with heavy, inefficient equipment would be counter productive.

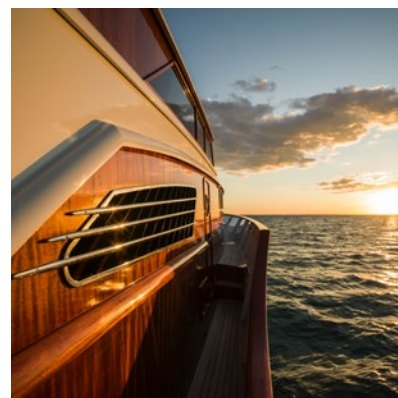


Case Study – Spirit P70



Spirit started by looking hard at generators and shore power systems; and they decided that a high-speed light weight, generator would not give the durability that they required. So they decided to stick with a 1500 rpm unit, and after very careful consideration a single Onan 13.5 kW was selected, as it was substantially lighter than the next model up. The challenge it left for the Spirit team was that the total loads on the boat could easily exceed 13.5 kW – most boats of this size would have a pair of 22.5 kW machines, something they passed to us to address.

On the shore cord Spirit wanted an isolation transformer (as is usual for Spirit builds) to provide total galvanic isolation from the shore. The decision was made to limit the boat to a single connection in order to avoid the weight of two isolation transformers. The Victron Isolation Transformer (with its toroidal windings) was chosen due to its light weight.



With the generator and shore arrangement choices already made Energy Solutions had to propose a system that would provide reliable, efficient power; and we also wanted to give the owner another feature on his wish list – silent operation at anchor.

The Hybrid solution for the P70 was built around two 8 kVA Victron Quattro's operating in parallel. The domestic battery bank was specified with 8 x 200 Ah (5 kWh) MG Energy lithium batteries in parallel giving a total capacity of 40 kWh. Lithium was the obvious choice as it is lightweight (less than 230 kg all up) and also allowed enough capacity (within the weight budget allowed) to give the owner silent operation at anchor.

Under way the boat can almost always be operated from the inverters with the alternators on the main engines providing power through a split charging arrangement. This system avoids the extra fuel consumption (as well as wear and tear) of running the generator. Another modest contribution to the vessels remarkable range.

Whether on shore power or generator the Quattro units support the power supply at points of high demand with energy from the batteries. Once the loads drop back any spare capacity is used to re-charge the batteries. This technology allows the peaks and troughs of power consumption to be smoothed avoiding heavy and costly 'oversized' supplies. The boat can operate very happily on a 32 amp shore cord with no compromises on board.

The P70 electrical system follows the Spirit theme – an elegant, efficient exterior – clothing the state-of-the-art technology beneath.



As well as the electrical system design, settings and software integration with other elements, Energy Solutions also supplied all the equipment, and undertook the design and build of the electrical panels for the boat.