

Marine LoadBanks



Sizing generators for large sailing and motor yachts is a difficult job. Large variations in on board power requirements between different seasons, different times of day, and periods with and without guests make for substantial power requirement swings.

Often, despite the very best engineering practice, the yacht will be operating the generators lightly loaded with the poor emissions, low exhaust gas temperatures and increased engine maintenance that this leads to.

To address this problem Energy Solutions have developed the ES LoadBank to be used with generators that are running lightly loaded. The 2015 model, ES LoadBank v5, combines heater tank, switch gear and expansion tank all in the same enclosure, reducing the footprint required to install the LoadBank. The PLC has also been upgraded which allows direct interfacing with a ship's system for control and monitoring. There is also a remote touchscreen control and monitoring panel, both options give flexibility for new builds and retrofits.

There are three, operator selectable, operating modes:

- Fixed Loadbank – maintains load at a fixed minimum at all times.
- Fuel saver mode – maintains generator at a target load for a certain proportion of any time period.
- Exhaust temperature mode – maintains exhaust gas temperature at target level for a certain proportion of any time period. Extra load will increase exhaust gas temperature, making it a great aid for generators with DPF (Diesel Particulate Filter) exhaust systems. These rely on high exhaust temperatures for the catalytic process.

ES LoadBank v5

Optimising Power for SuperYachts

Maximising generator life

In order to get the maximum life expectancy from a generator it should run at sufficient load to ensure clean running. When a generator runs under capacity its working life is cut short and the generator runs with soot emissions. The ES LoadBank is an advanced generator loading system that ensures that a sufficient base load is applied to the generator at all times. It uses electrical heaters as a load and this heat is transferred to sea water via an integral heat exchanger.

User configurable

The ES LoadBank can be user configured with generator size and target load. This allows the LoadBank to apply the correct amount of load to achieve your target loading.

The LoadBank will work with any brand of generator. Larger requirements can be met by specifying multiple LoadBanks which, via software settings, will work as a master and slave(s) arrangement.



LoadBank Control Panel

Control:

- 7" colour touchscreen – system monitoring and diagnostics
- System on / off switch
- Power on lamp
- LoadBank active lamp
- Fault lamp

Power:

- Supplied at 24V DC from LoadBank

Inputs:

- Remote shutdown input
- Up to three generators can be monitored either via voltage and current monitoring or via a 4 – 20mA power signal from the ships switchboard
- The unit can optionally be controlled by a single 4 – 20mA input that sets the required load. In this mode, the decision on applied load is made by the ships switchboard
- Fixed load input – when this input is enabled the LoadBank will apply a fixed load as determined on the touchscreen

Outputs:

- Applied load 4 - 20mA
- Coolant temperature 4 - 20mA
- Alarm relay
- Load active relay

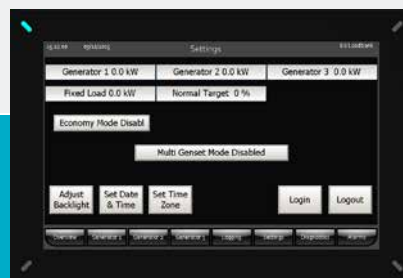
All values are available via Modbus TCP for integration into a ships monitoring system.

Dimensions (mm):

- 400H x 500W x 200D

Weight:

- 15kg



ES LoadBank - Optimising Generator Loading

	LoadBank Model 36kW	LoadBank Model 80kW	LoadBank Model 108kW	
				
Operating Voltages*	400V nominal	400V nominal	400V nominal	
Frequency	50/60Hz	50/60Hz	50/60Hz	
Control Cabinet	Remote	Remote	Remote	
Control Inputs	4 - 20mA load signals or CT's	4 - 20mA load signals or CT's	4 - 20mA load signals or CT's	
Control	PLC	PLC	PLC	
Load Steps	4 x 9kW steps	9 x 9kW steps	12 x 9kW steps	
Switching	Contactors	Contactors	Contactors	
Load elements	4 x 9kW	9 x 9kW	12 x 9kW	
Heater Tank Construction	316 Stainless steel	316 Stainless steel	316 Stainless steel	
Working pressure	0.3 - 1 Bar	0.3 - 1 Bar	0.3 - 1 Bar	
Test Pressure	1.75 Bar	1.75 Bar	1.75 Bar	
Temperature range	40°C - 80°C	40°C - 80°C	40°C - 80°C	
Cooling Primary	Closed system (inhibited water)	Closed system (inhibited water)	Closed system (inhibited water)	
Cooling Secondary	Sea water	Sea water	Sea water	
Cooling Secondary flow rate	Min flow 120l/min @ 14mtrs	Min flow 120l/min @ 14mtrs	Min flow 120l/min @ 14mtrs	
Safety Systems	Level switch, temp switch, pressure relief valve	Level switch, temp switch, pressure relief valve	Level switch, temp switch, pressure relief valve	
Outputs	Alarm relay output. Optional 4 - 20mA outputs	Alarm relay output. Optional 4 - 20mA outputs	Alarm relay output. Optional 4 - 20mA outputs	
	Size			
Dimensions (mm)	758H x 673W (871 inc. feet) x 602D	758H x 1190W (1388 inc. feet) x 602D	758H x 1378W (1568 inc. feet) x 602D	
Weight (approx.)	130kg dry	200kg dry	234kg dry	

* Other operating voltages are a possible, please contact us for information. (Details given are for guidance only and may be subject to change, E&OE.)

Case Study

ES LoadBank Established as a Superyacht Essential

Charter yachts often suffer with extensive periods of light loads on generators. For example in peak season, with hot weather, a full contingent of guests and daily cruising the generators will be working at near to full capacity but out of season, with no guests, power requirements are low. So, despite the best engineering practice, the generators will often be running under capacity, which is where the LoadBank steps in. When a generator runs under capacity its working life is cut short and the generator runs with increased soot emissions. The ES LoadBank is a sophisticated generator loading system that ensures that sufficient load is applied to the generator at all times – increasing its working efficiency and life span. Extra load will also increase exhaust gas temperature, making it a great aid for generators with DPF (Diesel Particulate Filter) exhaust systems. These rely on high exhaust temperatures for the catalytic process.

Already over 20 superyacht generators are running with ES LoadBanks and in Q4 2014 two more superyachts were fitted with units. The first of these was M/Y Blush and her Chief Engineer, Mark Cryer explains how the LoadBank has proved essential:

“I first came to know about the Energy Solutions LoadBank when I joined M/Y Blush in build. Having sailed on a large variety of commercial and pleasure vessels, and having not seen one before, I was naturally curious as to its practicality.

Having just come from a commercial vessel where we were overhauling 4X MTU 396 V12 generators; each of which were suffering badly from cylinder glazing and excess oil consumption. This was found to be primarily down to low load running. I thought the load bank was a prudent investment. I’ve found the load bank to be a cost effective and practical solution, to counteracting the damage that can be caused by low-load running on generators, which can be common in the industry.

Having now sailed with the product, I couldn’t recommend it highly enough. It couldn’t be easier to use. It’s just a matter of selecting whether you want it on, or not, and all the rest is automatic. It works to keep your generator in a healthy load range at all times.”

Motor Yacht Blush:

- Accommodation: 10 guests & 11 crew
- Length: just under 50 metres
- Speed: Up to 22 knots

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A member of Superyacht UK Energy Solutions is one of the many UK business in this sector powering innovation and growth in the market.



ES LoadBank

ES LoadBanks are designed and built in house by Energy Solutions. The standard models can be modified in design to fit an individual vessel.