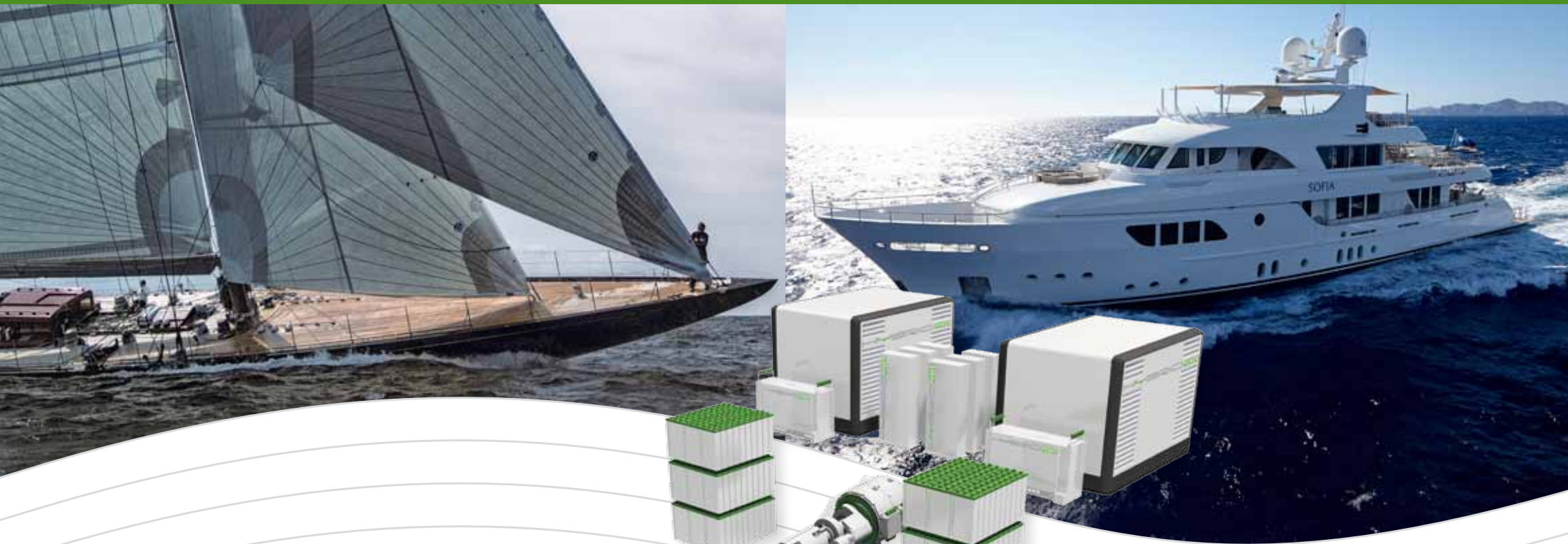


Hybrid Power & Propulsion Systems

Yachts • **Super Yachts** • Commercial Craft



Generating Confidence

HYBRID

At WhisperPower we are driven by a distinct challenge: we only consider our products to be perfect when you can neither see nor hear them. With this in mind, all our innovation efforts are geared towards creating silent and vibration-free generators and electrical systems that do their work without interruption.

We are not talking about loose components here but a unique combination brought together within our ingenious All-in-One PowerStation. WhisperPower sets itself apart by offering smart innovations that prove their value in everyday operation. In the most challenging conditions, you can fully rely on our PowerStation be it on the water, on the road or on land. That is the reason for our fast growth and worldwide success.

The future is now

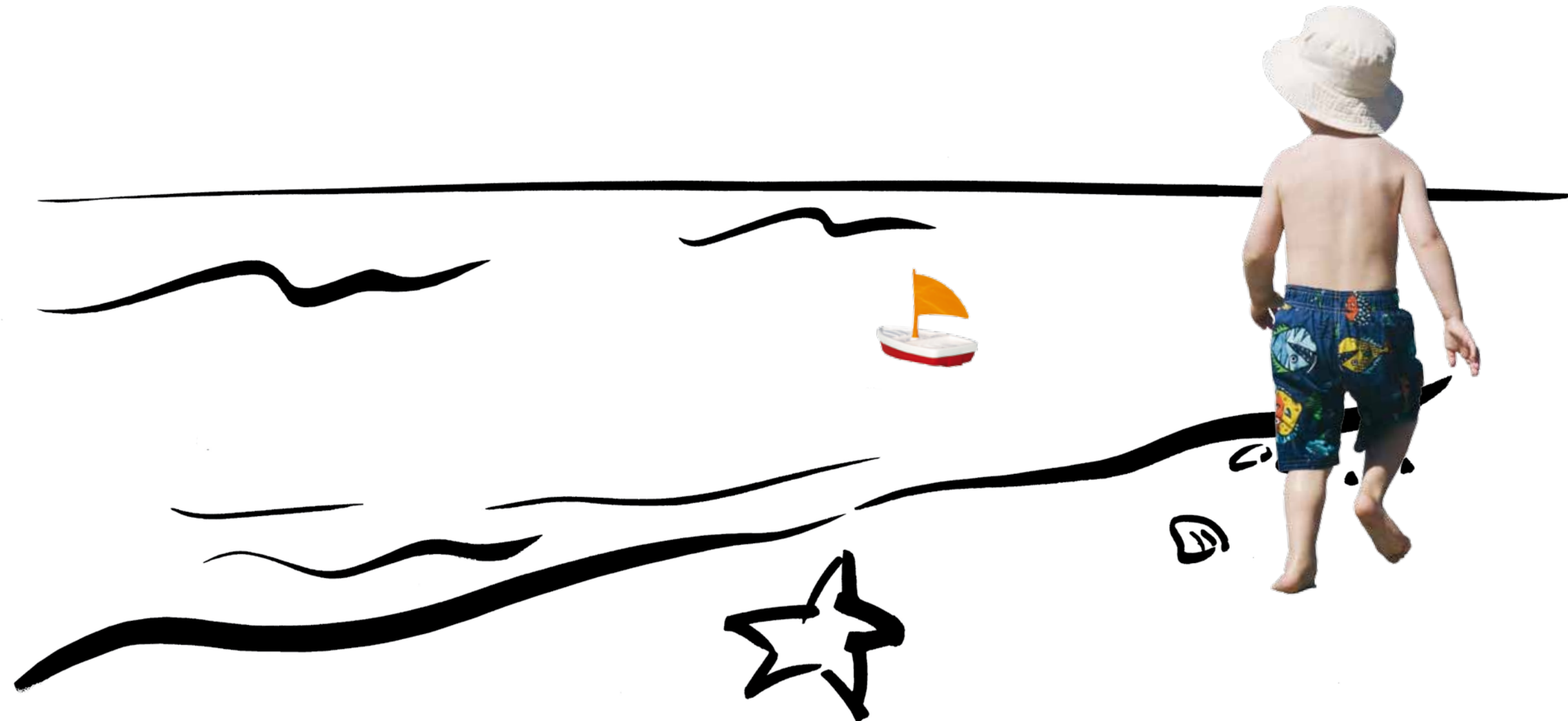
Say goodbye to space-consuming, noisy and energy-inefficient diesel engines that run round the clock.

Bid farewell to wasting vast amounts of energy, polluting the environment and the expenses of high maintenance systems.

Welcome to the future.
Welcome to the Power of Green...

The Power of Green

Our Serial Hybrid systems replace traditional propulsion engines with a highly efficient electric motor (up to 500kW), powered by a high-power Lithium Ion battery pack or variable-speed low-emission power generators. Our Parallel Hybrid systems are an add-on to the propulsion engine, enabling electric sailing for a number of hours. Our Hy-Gen compact and super silent generators replace traditional bulky and noisy generators



'Less is more with hybrid technology.'

A hybrid system combines electric propulsion with the means to produce and store energy in one exceptionally efficient solution. Based at the heart of the Dutch yachting industry, WhisperPower BV and sister company Hybrid Power Systems BV have developed the first fully integrated high-power hybrid solution designed especially for superyachts.

Less is more

We offer progressive owners and designers more power for less. By bringing electric propulsion into the power equation you will enjoy smart control of both your energy demands and power sources.

All this is achieved without loss of speed or concessions to comfort. On the contrary, less is undoubtedly more when customers choose our systems.

The Power of Integration

Our hybrid propulsion and power systems generate, store, use, exchange and control onboard energy in an independent and integrated way. The system can load balance peak periods by sharing the supply and energy from the storage. In off-peak periods the power sources are in optimal running mode and store any unused energy. A modular concept for power ratings from 10kW - 500kW combines propulsion, manoeuvring, hydraulic functions and the power for the hotel.

Less is more

Less pollution
Less emissions
Less weight

More fuel efficiency
More clean air
More flexibility

The Power of Clean

‘As fossil fuels run dry,
the price of powering
(super) yachts will
inevitably increase.
But the real cost of burning
vast amounts of diesel is
to the environment.’

A WhisperPower/Hybrid Power serial solution offers an exceptionally efficient energy-saving system with maximum output. And by dispensing with the main diesel propulsion engine you have a much greater flexibility in terms of layout and - a crucial factor on superyachts - considerable savings in weight.

In addition you can access pristine remote places and other protected zero-emission areas that diesel-engine superyachts cannot enter. The absence of the smell of exhaust fumes when at anchorage is a treat for swimmers and fish alike!

Smart power management

Conventional systems are wasteful in so many ways - the imbalance between night and day consumption means engines run at 50 percent capacity. A Hybrid Power system offers an ideal degree of flexibility thanks to its power balance.

The operation mode of each power source is optimised and the energy source runs in the most efficient way, saving fuel and costs. The use of variable speed generator sets means the power demands can vary at different rpms, unlike standard gensets with a fixed rpm and restricted operational curve. The result is significant fuel savings, greater environmental friendliness and an increased equipment life-span.

The Power of Peace and Quiet

Less is more

Less noise
Less vibration
Less waste

More comfort
More silence
More independence



‘Now you can enjoy sailing serenity without having to rely solely on sails; sensing and hearing the waves as well as being ecologically sound.’

Noise is an emission too... When dreaming of cruising the world's oceans and beauty spots, we manage to shut out the sound of the engines and generators. But in reality the throbbing of diesel propulsion and the whirring of the overall system can shatter the peace. And the vibrations that emanate through a yacht with conventional power are also an unwelcome distraction.

Sensing the waves

Now you can enjoy sailing serenity without having to rely solely on sails; sensing and hearing the waves as well as being ecologically sound. The option for silent operation time using the battery bank allows you to spend several hours in soundless surroundings in a secluded anchorage. You can also enter harbour without engines running, dock and then hook up to shorepower. Your marina neighbours are sure to be impressed too.

The Power of Storage

As well as low levels of noise and minimal vibrations, the option to turn off the generators and use batteries opens up a whole new range of benefits. The Hybrid Power function allows you to store your own energy, use it during peak periods and recharge during off-peak periods. It also provides back-up power in a blackout, protecting critical applications and systems.

The Power of Peace of Mind

Less is more

Less restrictions
Less maintenance
Less insecurity

More reliability
More experience
More customisation

‘Renowned Dutch quality is apparent in every aspect of the system. The main components are developed in the Netherlands and manufactured in a production facility with the highest environmental standards.’

Clean air equals a clean conscience... And you can also rest assured that a Hybrid Power solution provides maximum safety for you and your family, guests and crew members. Renowned Dutch quality is apparent in every aspect of the system. The main components are developed in the Netherlands and manufactured in a production facility with the highest environmental standards.

The Power of Convenience

Our systems also fully comply with all the various classification regulations related to superyachts such as Lloyds and ABS. And, in addition to the utmost reliability, your crew will be delighted with the simplicity of installation and operation.

The Power of Customisation

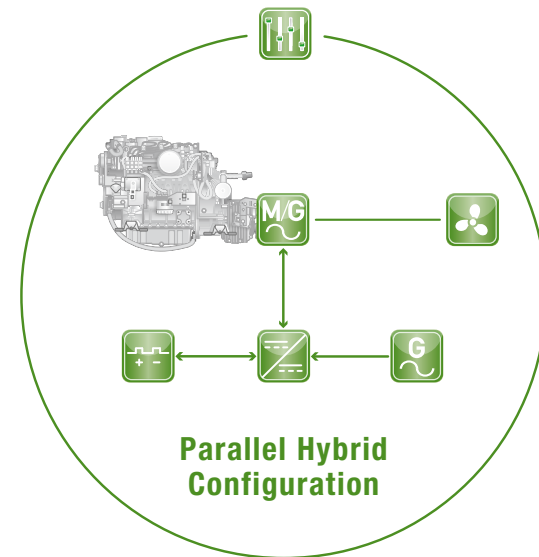
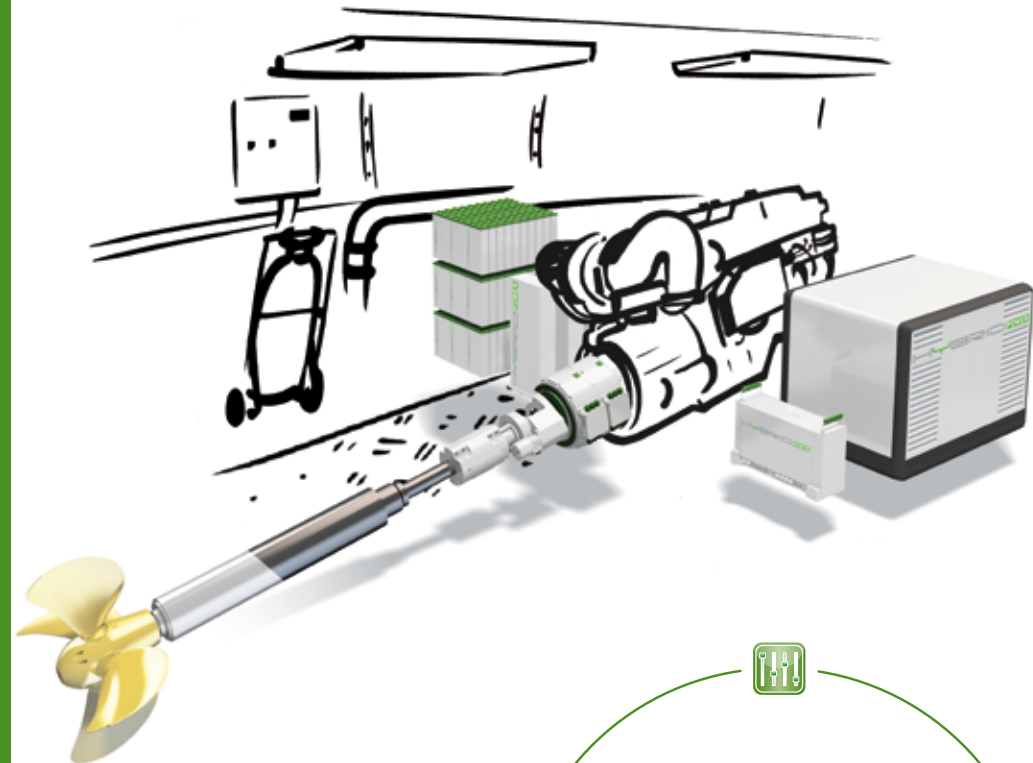
With over 15 years of experience in the world of superyachts, we understand the requirements of this specialised industry. Whether a refit or a new build, each project has distinctive requirements. Hybrid Power designs and manufactures bespoke solutions that exactly meet client needs. We serve the market for all recreational and small professional craft, sail and motor, with power requirements of 50kW and up.

The Power of Choice

Less is more

Less bulky equipment
Less space devoted
to propulsion
Less costs

More interior
More freedom of layout
More versatility



A major issue on every (super) yacht, motor and sail, is the precious onboard real estate. As ever-more technologies, equipment and home-from-home facilities are installed, they compete with the natural desire for comfortable lounges and cabins. The race for space is very much on.

Dispensing with the need for a conventional primary propulsion engine reduces the volume needed for a yacht's technical zone and radically enhances your freedom of design and layout. Moreover, as the 'engine room' is more like a generator room, it can be located in the best place for interior weight distribution and maintenance.

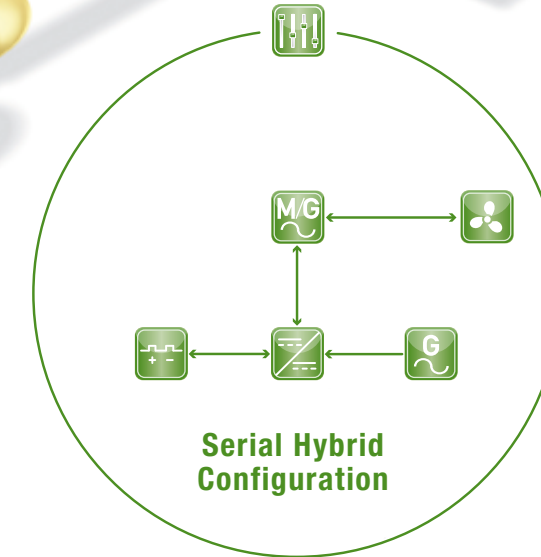
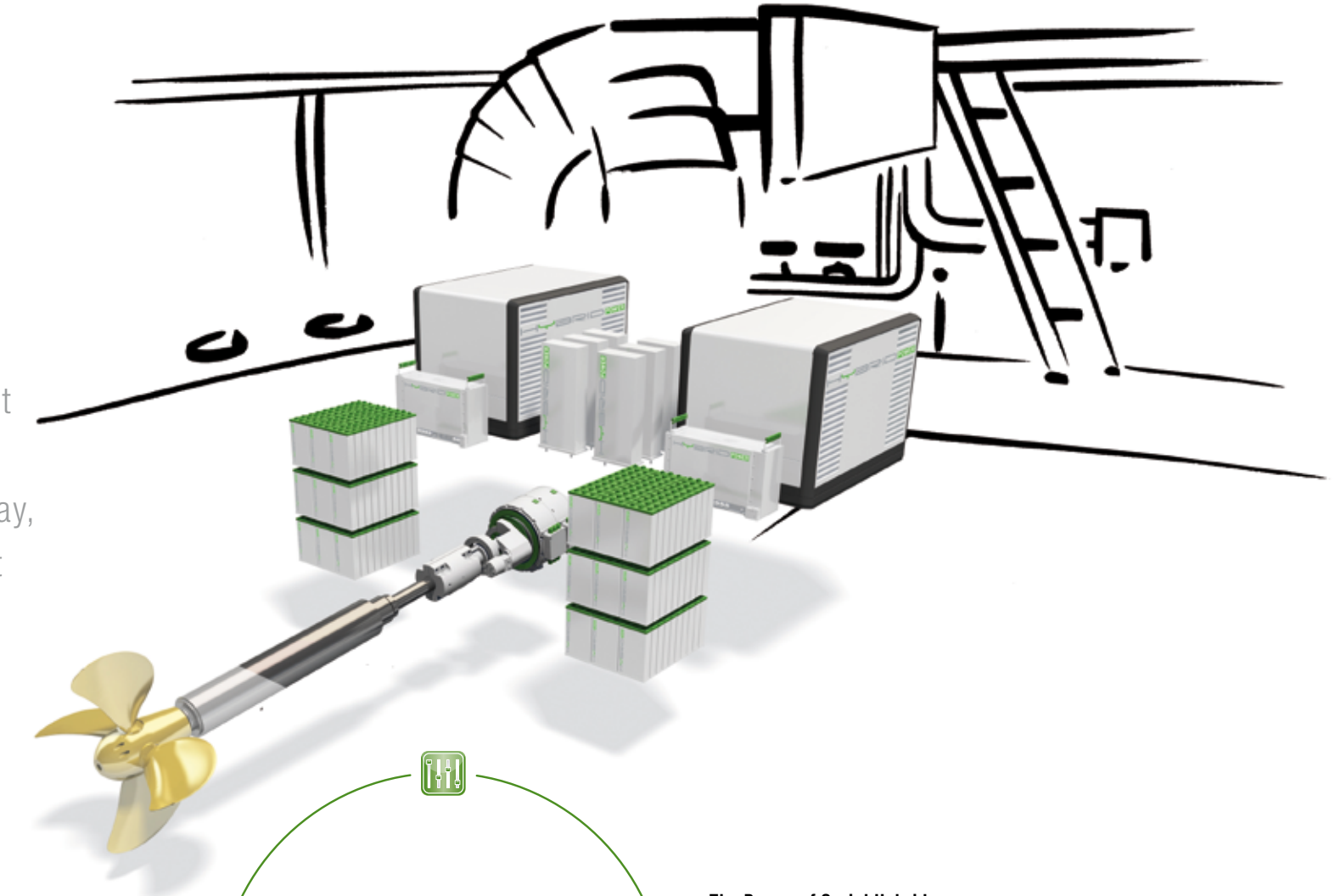
Modular thinking

The components of a Hybrid Power system are comprised of compact 'building blocks'. Configured in a modular way, they offer you significant benefits in terms of space and flexibility. Our innovative integration philosophy also means more components in less boxes... And further savings in space and weight.

The Power of Parallel Hybrid

Parallel Hybrid maintains the mechanical connection between the engine and propeller shaft, with the electric motor acting on the drive shaft in parallel with the engine. The Clutch is a mechanical device that allows the electrical motor to operate with the diesel engine shut off. You can drive the propeller directly from the engine or from the electric motor, or from both. You can also disconnect the propeller for a stand-alone generator function. The engine is disconnected during regeneration. (valid for sailing yachts)

'The components of a Hybrid Power system are comprised of compact 'building blocks'. Configured in a modular way, they offer you significant benefits in terms of space and flexibility.'



The Power of Serial Hybrid

In a Serial Hybrid system the conventional diesel engine is replaced by an electrical motor. A battery bank is connected to the common electric power bus, which is connected to the motor. The electrical energy is either provided by variable speed power generators or by the battery bank. With large batteries you can have long periods of electric propulsion (and/or driving onboard electrical appliances) without resorting to the generator.



Hy-Gen Variable Speed generators

The introduction of our Genverter range of products, in 2009, has been a break-through in the field of efficient, silent, vibration-free and space saving power generation. These products are based on intelligent, permanent magnet alternator technology, utilising ultra-compact diesel engines and fitted in a robust sound shield. Our low power Genverter range, available from 4 -10kW, provide either 230VAC/ 50Hz power or 24 V/48 VDC for battery charging, when fitted with our DC PowerCube modules.

Our Hy-Gen models are designed to feed a high DC power bus (750VDC), the Hy-Grid, which interconnects the propulsion systems, the AC power conversion system for the hotel load, the shore power and, eventually, the hybrid battery. Our Hy-Gen models are available from 50kW -150kW and can be operated in parallel without the need to add a synchronisation device. They are ideal to operate electric motors for auxiliary propulsion (eco-mode) and provide power for the on-board consumers at the same time. Now long distance cruising, at moderate speed, can be done in a fuel efficient and low-emission way.



4 cyl. based Hy-Gen
up to 75kW



6 cyl. based Hy-Gen
up to 150kW



Hy-Grid distribution system

The DC power distribution system that supplies electric power on demand from the power sources to the power consumers can be supplied by us as well. This device comprises an isolated and laminated copper busbar rail system with various switches, built into modular cabinets.



Hy-Invert AC power modules

Highly efficient DC to AC inverters are needed to smoothly convert power from the various DC sources into a sine wave single and three phase 230/400 VAC/ 50 Hz (or 60 Hz), vice versa. With power ratings of 150 kVA and more there is sufficient power to operate all the on board AC appliances including airconditioning.

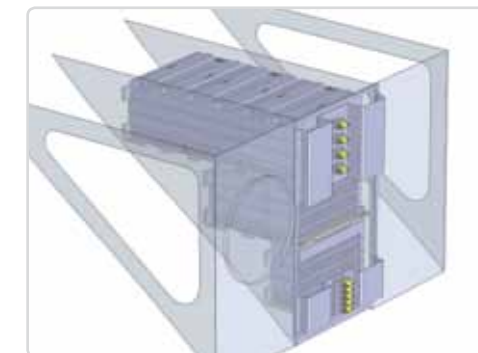


Hy-Invert 150kW
DC to AC inverter, watercooled



Hy-Store power storage

Deep cycle, long-life Lithium-Ion battery can be added to our Hybrid systems, providing emission-free power for propulsion and/or power generation, without operating the auxiliary generators (Hy-Gen) or using the engines. Capacity, voltage and mechanical configuration vary with each system.



Example of a hull-integrated
Lithium battery bank



Hy-Charge battery charging

This is needed for recharging the Lithium-Ion battery bank from the Hy-Gen power packs or shorepower.



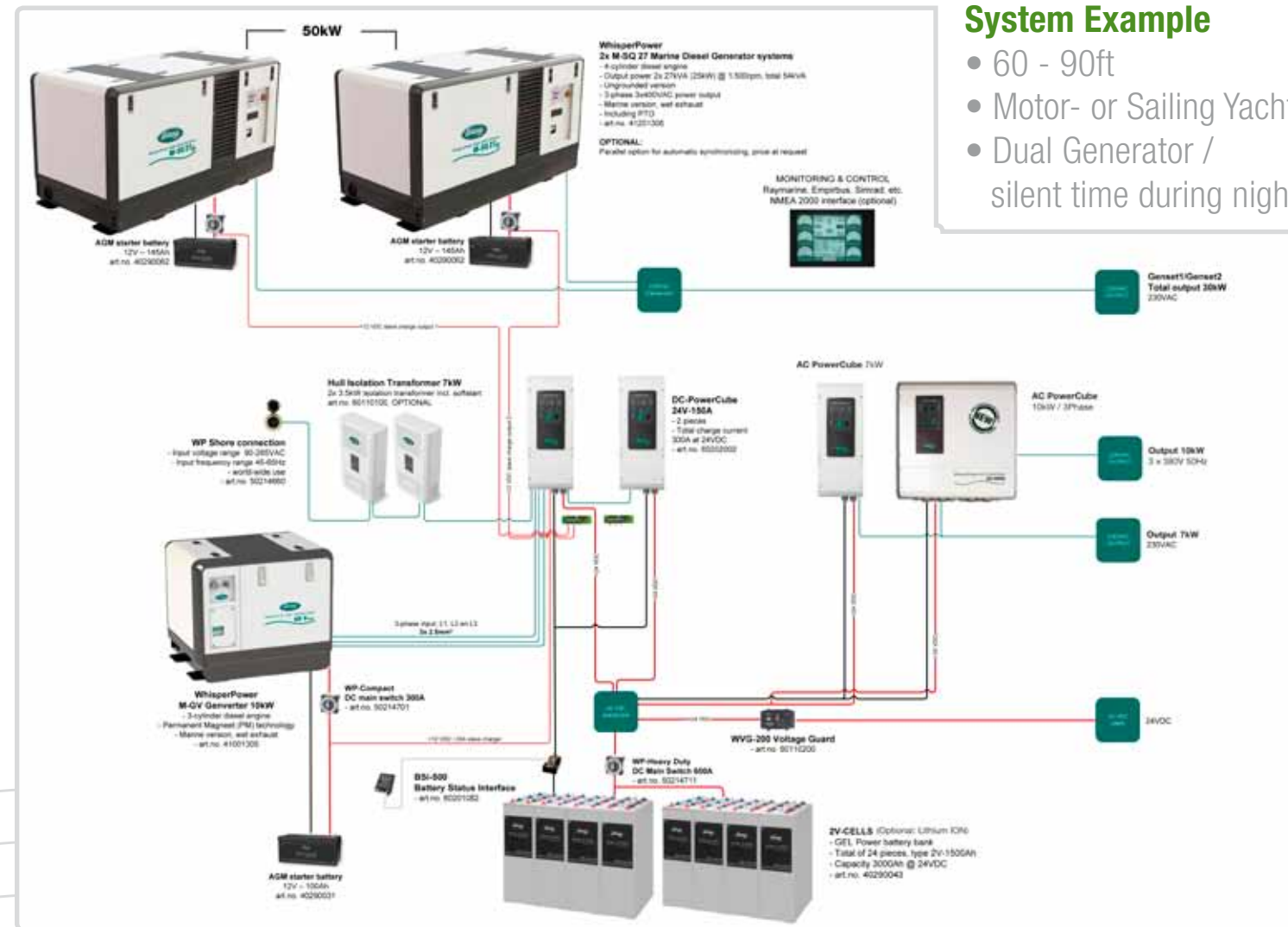
Hy-Shaft for re-generation

For sailing yachts we provide shaft alternators of 50kW or more to supply power to the on-board consumers and/or charge the house battery bank.



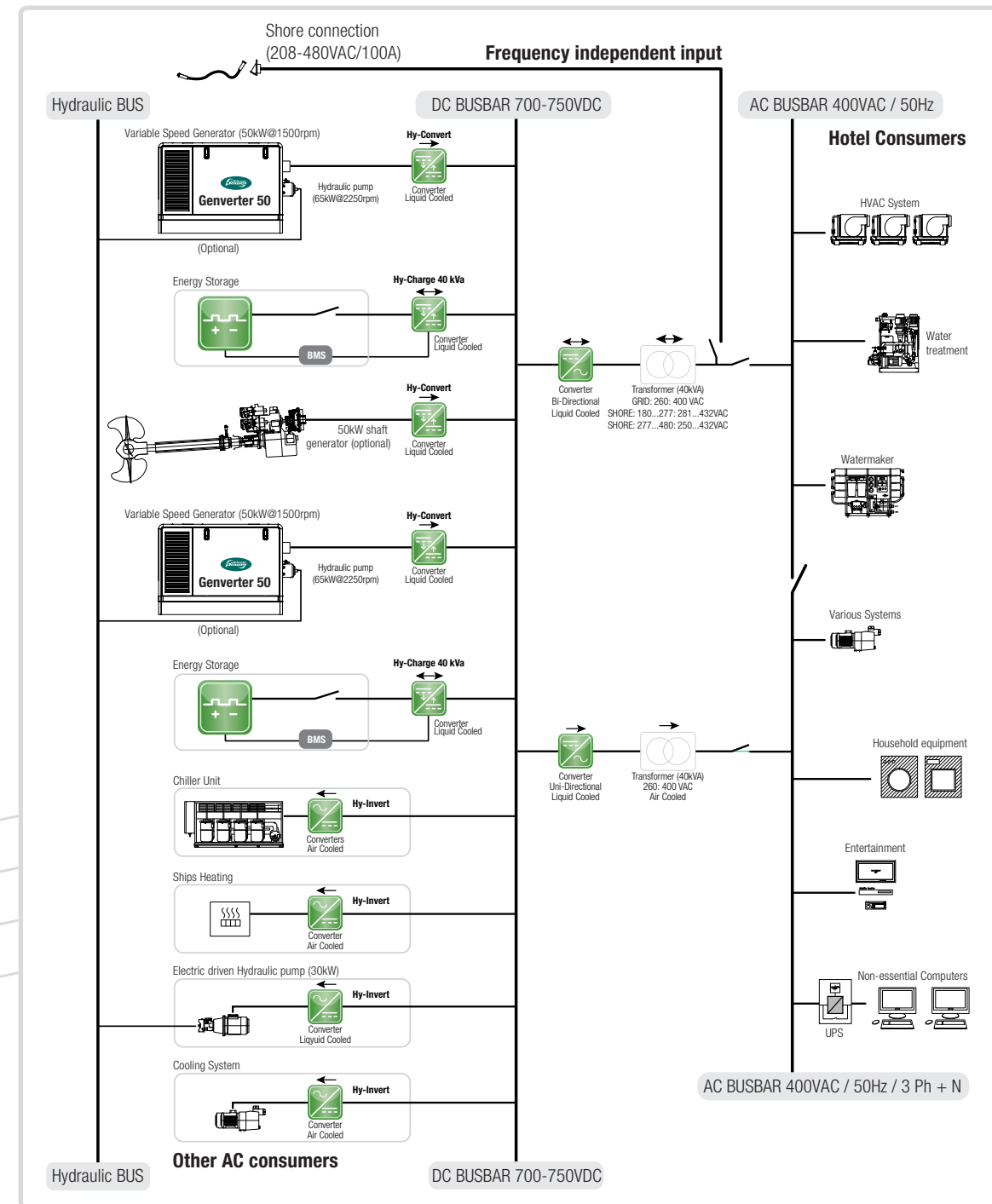
Hy-Gen Shaft
Alternator 50kW

System Examples



System Example

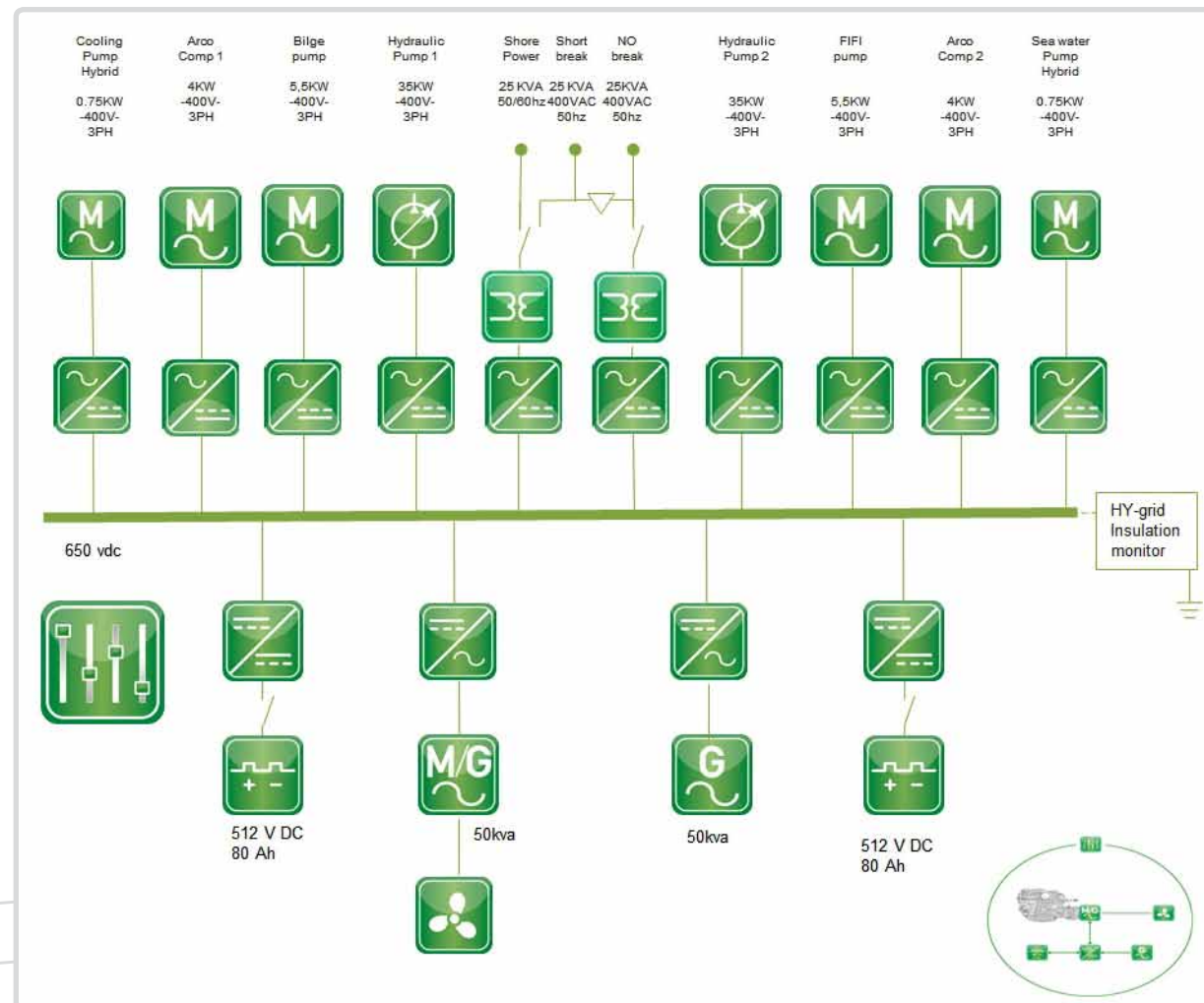
- 60 - 90ft
- Motor- or Sailing Yacht
- Dual Generator / silent time during night



System Example

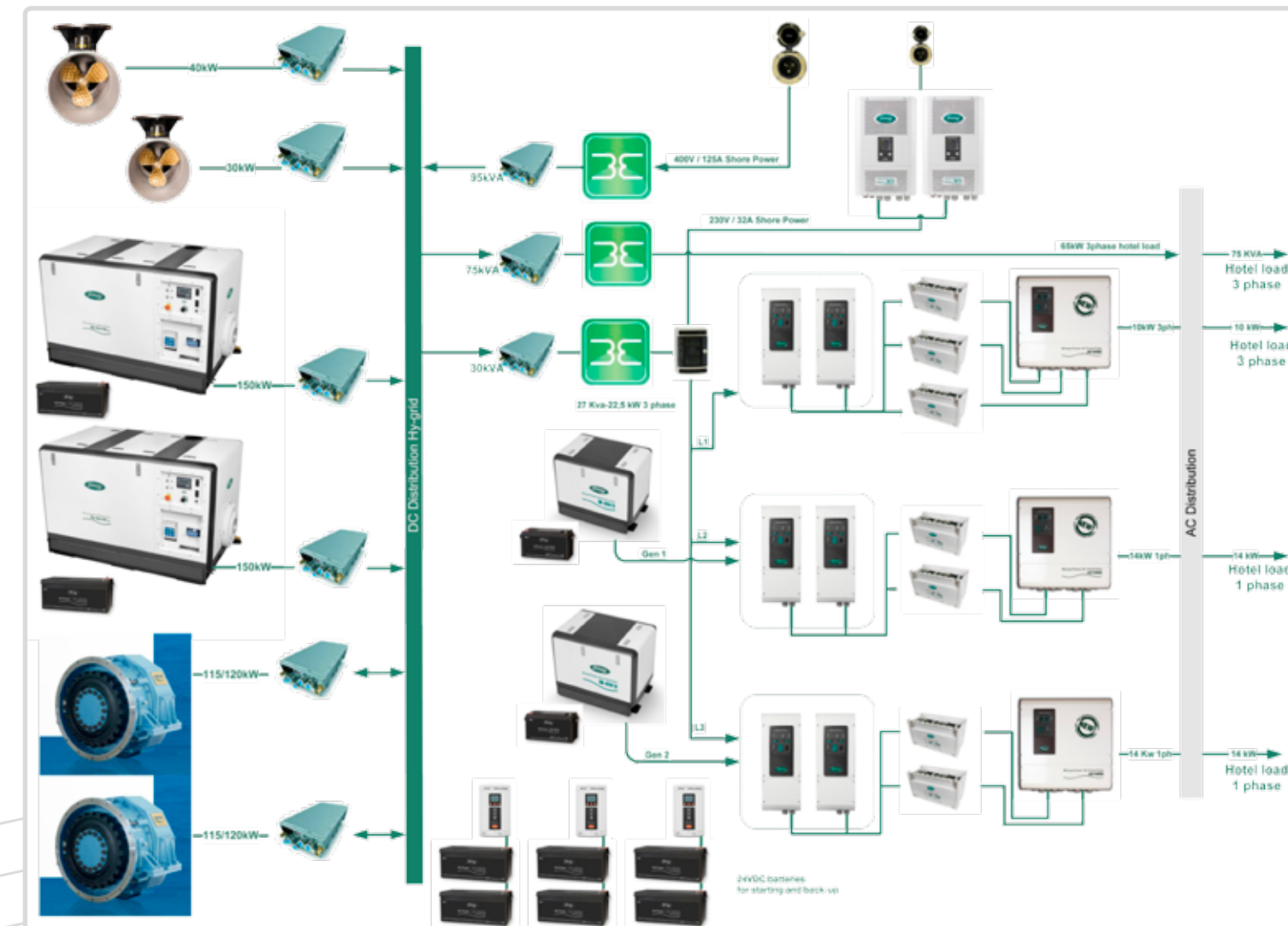
- 120 - 150ft
- Sailing Yacht
- 100kW Generator - Power (Hy-Gen) programmable speed, connected to the DC Bus
- 50kW Shaft generator - Hy-Shift

HYBRID



System Example

- 100 - 140ft
- Sailing Yacht
- Hybrid Propulsion 50kW
- Power Generation by Hy-Gen 50kW
- Shaft alternator 50kW
- Extended silent time



System Example

- 100-130ft
 - Motor Yacht semi-displacement
 - 300kW programmable rpm generators
 - Diesel-Electric 'ECO' mode
 - Hotel load from same system
 - Silent time during night & at anchorage
- Based on 24VDC battery banks 6000/7000Ah



Standard, innovative solutions ‘Off the shelf’

Superyachts and professional crafts of today are placing ever-increasing demands on their electrical systems, the systems are used day and night. WhisperPower is offering a full range of standard ‘big boat’ components and systems that are intelligent, compact and robust.

Detailed below are the ranges we offer for these yachts and their features and benefits.

Super silent diesel generators 27-54kVA 1500/1800 rpm → Parallel

- WhisperPower SQ 27 - 27kVA power rating, 3 x 400VAC/ 50 - 60Hz
- Extremely compact (800h x 680w x 1260d mm, 580kg)
- Super silent, minimal vibration
- Can be paralleled with second unit → 54kVA power rating = fuel saving feature
- Available with POWER TAKE - OFF for hydraulics
- Can be fitted with Hydraulic BOOST function to deliver more hydraulic power
- Complete delivery with attractive sound shield and plug-and-play connections
- AVR regulated Stamford back-end with Booster for 20% more surge power
- Lloyds/ GL/ DNV/ ABS approval optional
- Powered by Mitsubishi long life 4 cylinder diesel engines
- Supplied with complete installation kits including exhaust system



Available up to 32kW

Dual function DC power chargers 100-1200 Amps → Parallel

- DC PowerCube, high power chargers, 24V/ 120A
- Ideal to convert AC dock power to DC on board power
- Parallelable - 240A/ 360A/ 480A etc.
- Battery charger suitable to charge for AGM, GEL, Lithium-Ion
- Input voltage 90-260VAC, single phase or 3 x 208VAC – 50/60Hz
- Compatible with Genverter 2/3/4 cylinder for Silent Diesel Power Charging
- Lloyds/ GL/ DNV/ ABS optional



High power sine wave inverters 5-30kVA→ Parallel

- AC PowerCube(s) completes DC PowerCube system
- Silent power during generator-off time
- Pure sine wave output synchronizing with shore power and generator
- Inverters are able to increase generator power (peak shaving effect)
- 300% peak power, ideal to start up heavy inductive loads
- Modular concept of 3.5 or 7kVA modules, can be used in parallel
- Remote monitoring and integration to total ship system



Smart frequency converters up to 30kVA

- Existing systems components are used, no extra ‘box’ needed
- DC PowerCubes convert shore power to a DC bus
- AC PowerCubes convert DC into the desired AC voltage/ frequency

Durable long life batteries

- High power battery banks up to 8000Ah/ 24VDC, OPzV
- Maintenance free, can be stowed away - vertically, horizontally
- Perfect solution for extended ‘dead ship’ periods
- Turn- key Lithium-Ion battery banks including all relevant Charging/discharging devices



Reference list (selection)

Sail

Royal Huisman Shipyards
Contest Yachts
HJB
Hanse Yachts
Schöchl Yachtbau
Hallberg Rassy
Nautor Swan
Hodgdon Yachts
Delphia Yachts
Sirius Werft
Oyster

Motor

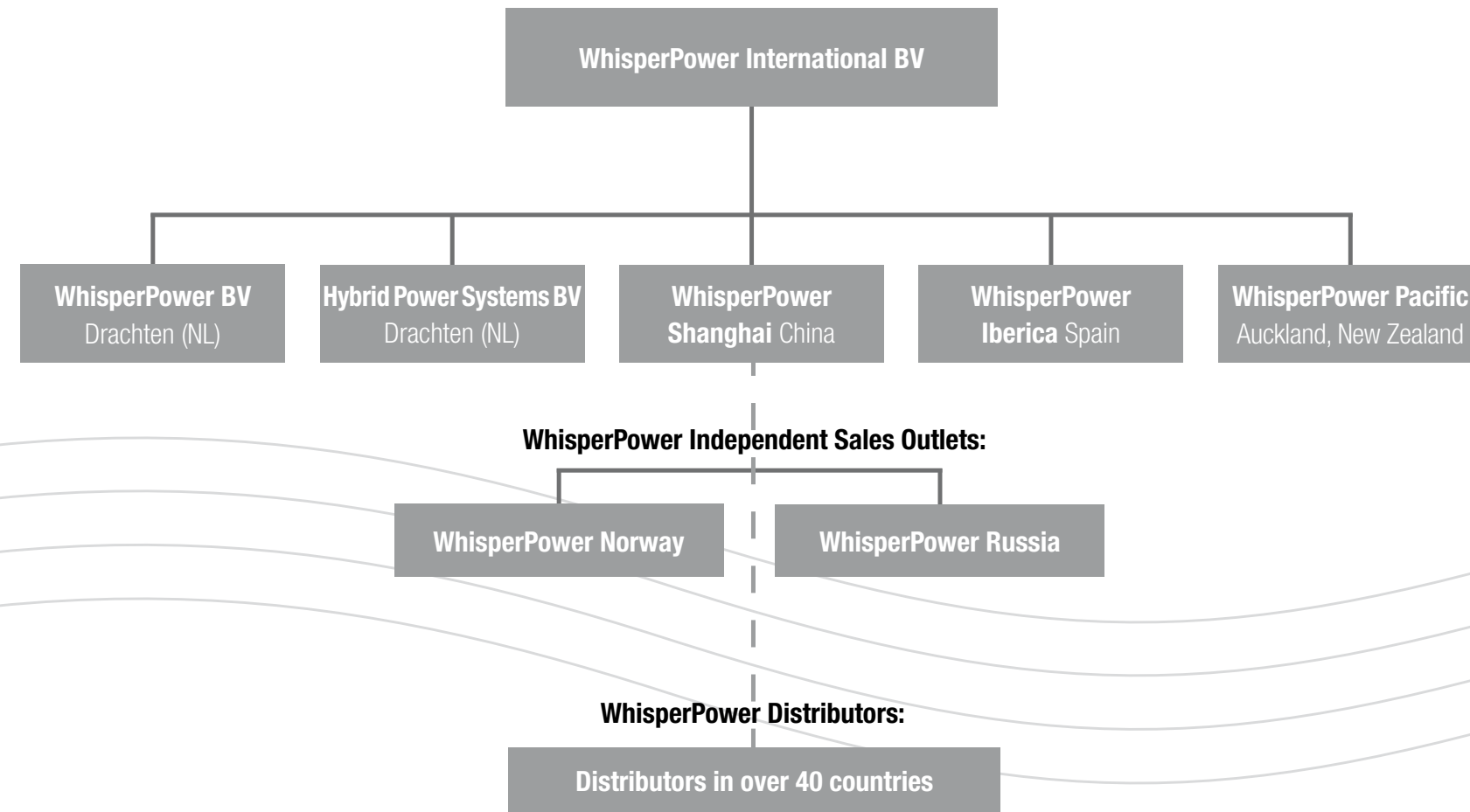
Moonen Yachts
Mulder Yachts
Jetten Yachting
Linssen Yachts
Wim van der Valk Yachts
Pacific Yachts
Steeler Yachts
Sturier Yachts
Piper Boats
Serious Yachts
Windy Boats

The company

WhisperPower BV was founded in May 2007 after acquiring the assets of the former Mastervolt Generator Systems division, located in Drachten, the Netherlands. Hybrid Power Systems

BV was founded in 2009 with the aim of developing and manufacturing combined hybrid and propulsion systems for super yachts and commercial craft.

WhisperPower Group of Companies



WhisperPower and Hybrid Power are now established brands with world wide distribution and service. The product portfolio has increased from small generators, low power inverters and battery chargers, to high power generators, inverters, battery chargers and battery storage systems. The essence of the way of putting systems together is simple but smart: Generators are made smaller by using modern engines, in some cases turbo based, with PM Permanent Magnet back-ends to generate electric power.

Manufacturing

Most of the manufacturing process is carried out in-house in our 5500 m2 building, located in Drachten, Friesland, the Netherlands. The building is a showcase for the very latest thinking in terms of energy-friendly sustainability and includes facilities such as solar cells and climate control based on an eco-energy recovery system. We save as much energy as possible in all our daily operations, using thermal storage for residual heat or power. All our products and systems are severely in-house tested before shipping.



Represented in over 50 countries
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