

Silent running

AS DEMAND FOR POWER GROWS TO DRIVE A STEADY PROLIFERATION OF ELECTRICAL AND ELECTRONIC SYSTEMS AND EQUIPMENT, THE ON-BOARD POWER SECTOR HAS BEEN REFINING ITS PRODUCTS TO MEET BOAT OWNERS' RISING EXPECTATIONS

WORDS: BOB GREENWOOD

IT'S SELF-EVIDENT

THAT the growth in onboard electrical systems and gadgetry has brought with it a corresponding upsurge in the demand for power in recreational craft of all sizes. Even the smallest day cruisers these days are fitted out with sophisticated and sometimes extensive power systems. That power not only has to be generated and/or provided by shore supplies when yachts – power and sail – are docked, it also has to be processed, transferred and managed according to application, be it AC for air-conditioning or DC for lighting or sensitive electronics.

Compared with, for example, the industrial market which often requires standardised power generation and management equipment that's rugged, reliable and unfussy, yachting places some exacting demands on its onboard power providers. *IBI* conducted a straw poll among the 20 companies that provided information and views on the dynamics of this specialist market sector. We asked them to list in order of importance 10 customer priorities suggested by us, with one 'other' choice specified by them.

Manufacturers' interests ranged from generators to inverters, chargers, distribution and control systems, some targeting particular segments of the market. Customer values could always be expected to differ accordingly. Clearly, the smaller the boat,



▲ Westerbeke's 6.5 EDT generator set

the more important the onboard power package size becomes, for example. The same is probably true for control sophistication or how easy the equipment is to install. The latter is likely to be more of an issue for the owner of a small production cruiser on a modest budget and a willingness to do at least some of the work himself, than for the owner of a custom-built superyacht who's more likely to want a tailored onboard power system. Fitting it all is then an issue to his project manager, naval architect and the yacht builder.

But it's a given that, however great or small the need, everybody expects trouble-free reliability and optimum efficiency for their money. In our survey, however, the consensus view was that what boat owners value above all is

“What boat owners value above all is quietness of operation, and by a significant margin product quality”

quietness of operation, and by a significant margin over the next most important product quality. Easy – and low, or no maintenance – was the second choice, while compactness ran it close at third, with a couple of respondents bracketing that with low weight.

Protection of more delicate electronic systems from power spikes ranked as the fourth choice, followed by protection from electromagnetic interference and ease of installation in fifth and sixth place.

The lowest-scoring values in the experience of manufacturers were low price, product ascetics and remote control and communication with smartphones, tablets or similar devices. Other suggestions made by the respondents themselves included 'onboard life experience' and environmental friendliness, hassle-free operation, automatic operation, high efficiency and true sine wave power for smooth operation.

QUALITY AND COMPLIANCE

What are we to make of all of this? It's obvious that onboard power is not a glamour sector. Although boat owners don't want it to encroach on enjoyment of their living space, it's an absolute essential. As such, it's one not particularly price-sensitive. Even in long periods of economic contraction they want the best and are prepared to pay for it.

Often large and heavy, and in the past often noisy and smoky as well, diesel generators pose a double-edged challenge for their manufacturers in the yacht market. First, like most non-road diesel ➔

engines they must comply with US EPA Tier 3 and equivalent European Union emissions regulations. At the same time, they need to meet the exacting demands of yacht owners, particularly at the higher end of that boating market segment.

Greg Klompenhouwer, senior product manager for diesel generators with major US producer Kohler, explains: “We have taken steps in innovation to deal with emissions changes and market demand for compact, low-vibration and smoke-free diesel generators. That’s difficult with diesel, but with larger models we have made great strides forward.”

Klompenhouwer says Europe is Kohler’s largest recreational boating market area for diesel gensets. Most large yachts (over 24m) usually have twin gensets to give redundancy, and often three, with one for night duty. “Each yacht has a specific need and our genset designers have had to make them as compact as possible to fit the confined space of engine rooms. Even on the largest yachts, space is critical,” comments Klompenhouwer adding: “Owners always want more living space aboard.”

Already an important player in the large-yacht sector for diesel gensets, Kohler is looking to expand its presence there by investing in more production capacity, possibly by acquisition of an existing business in Europe, Greg Klompenhouwer reveals. It already owns Lombardini, a long-established name in the marine diesel market, having bought the Italian business about 10 years ago. Klompenhouwer reckons that Kohler trails both Northern Lights in the superyacht market for large diesel generators where he sees it as market leader and Cummins Onan which dominates in the mid-range.

“Western Europe is mainly a market for diesel generators of 13kW-200kW, where they are installed in most boats from higher-end grp production craft to custom



▲ Kohler’s Greg Klompenhouwer



▲ Colin Puckett, VP sales Northern Lights

builds,” Klompenhouwer says.

In North America, which is overwhelmingly a small-powerboat boating market, it’s small gasoline generators of 13kW that predominate. “That’s where we have the biggest market share. It’s high volume, but less dollar value,” he adds.

Kohler is also working on building its presence in the commercial marine market, leveraging its expertise in producing gensets for large recreational crafts. “There’s a new business opportunity for us there with our parallel controller. This has already opened doors for us in the commercial world,” Greg Klompenhouwer says, citing as an example a fleet owner who needed more generating capacity in his ships. “If

he bought larger generators he would have been faced with having to move bulkheads in whole fleet of identical crafts – an impossible prospect. Instead we offered him the possibility of using two smaller generators working in parallel with our controller with parallel software tying the two sets together. He was very pleased with

the solution.”

Also with a close focus on the superyacht sector is US-based Northern Lights. Colin Puckett, vice president of sales and marketing acknowledges that the company is small in volume

terms compared with much larger manufacturers of diesel generators which serve far wider markets, but says: “We are unique in our singular market focus and dedication to power generation systems. We are known for high quality and worldwide support to meet the needs of the most demanding customers.”

Commenting on advances in marine generator technology, Puckett says regulatory demands have led to some impressive advances in overall engine performance and efficiency, but the two areas with the most advancement have been paralleling control systems and exhaust after treatment. “We are working with several leading suppliers in both areas to offer our customers a full suite of controls, monitoring systems and exhaust treatment solutions to maximize their onboard intelligence and the cleanliness of their generators.”

Electronic control and integration, he adds, are increasingly important. Diesel engines are a tried-and-true technology, but the way the systems are monitored and controlled reflects the advancement in technologies in all of the other aspects of our lives. “We live in a smart phone and touch screen world and customers want to see those types of interfaces carry over to all aspects of their lives, boats included,” he notes.

As for the demand for electrical power on yachts, Colin Puckett observes it hasn’t grown so much as changed. The addition of energy efficient appliances and LED lighting has lessened the average onboard loads, but other technologies such as zero-speed stabilizers have led to the demand for larger generators that are only required for short term spikes in power consumption. “This makes a good crew and an intelligent power management plan an absolute must, he says, adding the HVAC system is still the heaviest power consumer onboard.

Northern Lights’ acquisition of Technicold HVAC systems is a direct response to that dynamic, and has given the company “the capability to engineer yacht power generation and HVAC equipment in tandem (and create) a fully customised system that incorporates the power generation and largest power consumer in one optimised package,” Puckett explains.

In spite of the ever-quicken pace of technical change in the modern ➔

GREG KLOMPENHOUWER | SENIOR PRODUCT MANAGER KOHLER

Western Europe is mainly a market for diesel generators ranging 13kW-200kW

world, the marine market tends to be quite conservative when approaching new technologies and solutions. Marco Monsurrò, CEO of Italian marine generator manufacturer Coelmo, comments: “I have seen an increasing attention to integrated automation on board as today the focus is more on the whole onboard life experience than the simple boat ownership.”

The closer that this moves towards the ‘home-like’ model, the better, he believes. Boat owners, he says, want electrical systems that “leave them free to enjoy the life afloat without the pain of choosing the right power source.” Monsurrò says that a consequence of that is a marked rise in demand for more electrical power. “Consider that 10 years ago, a 3kW generator for a 50ft boat was standard, while today most 30ft boats come as standard with a 3.5kW generator. But while power demand, particularly from air conditioning and galley equipment, the rate of increase has been tempered by the improved energy efficiency of individual appliances. “Innovations such as inverter compressors and induction cooking has reduced power consumption over the past 10 years,” he points out.

The need for sophisticated onboard power systems has also been driven by inadequate shore power at many marinas, Monsurrò suggests. Most marinas, he states, were designed and developed over 10 years ago when lower power loads from boats were taken into account. On average, he says, this meets less than 40% of today’s requirements. “This is why systems like our Integra — a single system that monitors and manages all energy systems on board and shares the information on a CAN Bus — is critical when it comes to integrating the power from shore with the power stored in batteries with no break in AC output.”

Coelmo is one of the community of specialist equipment and systems companies that has grown up around

the Italian yacht building industry over several decades. On the generator side other notable companies include Mase Generators and Volpi Tecno Energia (VTE). General manager Dino Salvemini, concurs with Coelmo about integration of onboard power provision into the general matrix of boat monitoring and control systems. “It is very important and Mase has made new products, new instruments and new control system to integrate generators and battery charger with other onboard systems and displays,” he says.

Like others in our survey, Salvemini has also witnessed a large improvement in the performance of generators over the past five years, with less noise and vibration, and fewer emissions. At the same time, he observes that “the quality of the shore power has been improved worldwide, but now the largest yachts require more lines for different power consumers”.

VTE’s speciality is permanent magnet generators (PMGs) which Riccardo Snaidero, CEO and company shareholder, says offer substantial weight and space savings. “PMG generators also match the benefits of the 3,000rpm generators with the benefits of running at 1,500rpm, so they are compact, light, and really

quiet. Even the diesel consumption is reduced,” he claims.

Recently VTE has developed variable speed generators. These allow the speed of the diesel engine to adjust according to the electricity demands of appliances in use, but an inverter taking the output from the generator’s alternator provides a constant output voltage. German company Fischer Panda is a pioneer in such technology and has been offering it for decades. Jens Langer, the company’s sales and marketing director, says that variable-speed marine generators technology provide more flexibility and weight savings for yachts than conventional gensets. Even so, “the most interesting topic in onboard power



▲ Marco Monsurrò
CEO Coelmo

▲ Tecno Energia’s
Dino Salvemini

management,” he says, “is the ability to provide modern communication interfaces between the different control systems of yachts.”

The superyacht sector, in particular, has asked for the facility to integrate almost all electrical and electronic devices to one bus communication system. This might be realised by NMEA 2000 or other CAN standards. Jens Langer comments: “This topic has become more and more interesting in the past five years. Although many boat owners, mainly in the yacht range up to 60ft, are generally not much interested in ‘touch-panel architecture’, above that range modern and innovative management and control systems are definitely an important issue.”

Langer also sees the introduction of lithium ion battery technology, with its considerable weight and volume savings, as an important development in onboard marine power technology.

The whole business of onboard power generation has grown substantially in recent years. Jens Langer explains: “Ten years ago most yacht of less than 50ft did not have any generator onboard. But since this time air conditioning, electronic devices, power electronics and other electrical consumers have increased dramatically. Nowadays generators on motorboats from 35ft and sailboats from 45ft are at the very least optional equipment.”

POWER CONVERSION AND HANDLING

The theme of recent improvement in onboard power handling through systems integration and advances in technology continues downstream from the generation of electrical power through to its transfer and processing via inverters, chargers, connectors and

MARCO MONSURRÒ | CEO
COELMO

Today the focus is more on the whole onboard life experience than the simple boat ownership

switching. Netherlands-based Mastervolt, now part of the large US boat equipment and systems manufacturing company Marinco, takes up the relay batten.

Bert Jansen, commercial leader EMEA for Mastervolt Marinco, comments on the most important technical advances in onboard power provision over the past five years: "Without a doubt, the introduction of new technologies. New lithium ion battery technology (MLI Ultra at Mastervolt) is a key factor for saving weight and space and also enables higher power storage generally."

He adds that decentralised digital switching and monitoring (CZone at Mastervolt) enables builders and users of boats to enter the world of enhanced capabilities and ease of operation. Mastervolt's CZone products offer simple operation by the use of 'Modes of Operation' enabling the running of the electrical system of a boat with one simple push of a button. "The other main feature is the integration with electrical suppliers such as Garmin, Simrad and B&G. Through co-operation we enable glass bridge integration of multiple systems on one screen. Mostly, this screen is already at the helm so besides easier operation it also saves the investment in another display," he explains.

Such integration, Jansen says, "has become very important. Besides ease of operation, cost saving, easier installation and added functionality it is simply what the boat owner of today expects."

In his view, the leisure marine industry has become the last industry in the world to embrace embedded digital technology. "Imagine a car or airplane without it? The industry is slowly discovering the advantages and focuses on the possibilities, not the impossibilities.

While switching to new technologies



▲ Jens Langer, Fischer Panda

▲ Bert Jansen, Mastervolt

"is never easy, but inevitable," Jansen foresees boat owners take it for granted that they should be able to take their home comfort (aircon, heating, kitchen equipment, audio visual entertainment_ onboard, therefore power requirements over the last decade have basically doubled. Sailors also expect (rightfully so) to be able to operate equipment without having to go back to school. These increasing demands ensure employment for companies in the market.


Gregory Silman, Marine Original Equipment(MAOE) UK sales manager at Dometic Group, agrees: "Customers expect to be able to use the same products onboard as they would use at home. They therefore want their generators and other onboard power systems to be easy to install, small, quiet and efficient. Smart and more efficient AC products and efficient inverter technology are some of the key requirements of boat owners."


INTEGRATION

Product aesthetics are also important, he says, while users also expect quiet operation and protection features to be part of the scope of delivery. For technical preferences, "the market swing on the inverters is towards the pure sine wave," he says. "This is because they will operate all mains appliances, assuming you select the correct unit for your system loads."

The underlying significant trend Gregory Silman believes, however, is the integration of onboard electrical systems. This is an area in which his own company has made significant advances. "The standard bus interface featured in our WAECO chargers means they can be integrated into Dometic Bus systems, while the bus interface with the WAECO inverters increases the available power and the MPC (intelligent management system) is the interface to monitor and control all the available functions."


The Dometic Variable Frequency Drive (VFD) – a type of adjustable-speed drive used in electro-mechanical drive systems to control AC motor speed and torque by varying motor input frequency and voltage – "was the first available to the marine market and represents a clear breakthrough in marine VFD technology." Silman says, adding "it offers extensive benefits to builders and owners, including the elimination of electrical and navigation system interference." ➔







RELIABILITY ON BOARD

PROVIDING WORLDWIDE PUMPING SOLUTIONS SINCE 1968
 Engine cooling, water pressure systems, lavatory and waste water handling, impellers, bilge, deckwash, marine toilets and heaters...



See our 2015 catalogue for our complete product offering







▲ **Gregory Silman,**
Dometic Marine

▲ **Marcel Pith,**
Tijssen Elektro

In addition to the bus technology in the WAECO mobile power systems, “the demand for overall control is reflected in Dometic’s new products,” he says. These include the company’s new Smart Touch Integrated Intelligence Control (STIIC), an Internet remote control for onboard Dometic systems. “This software communicates interactively with boat owners to give them unprecedented monitoring and control by connecting systems such as air conditioning, watermakers, ice-makers, refrigeration systems and engine ventilation systems to the STIIC network,” Silman explains.

SINE OF THE TIMES

Other major advances in the past five years is sine wave inverter technology. Inverters use DC power from the boat’s batteries to produce AC power for heavy power consumers such as air conditioning and galley appliances. Compared with cheaper modified sine wave inverters, pure sine wave are more stable and smoother DC supply, which in turn enables appliances to function more smoothly and without buzzing or humming, and they consume less energy.

The downside has been more capital cost, but that has been changing. Don Wilson, sales applications engineer of Xantrex brand of US power products specialist Schneider Electric, comments: “Newer technology allows true sine wave technology to be much more affordable than five years ago,” he says, adding: “Also, the ability to use a common bus communication protocol for multiple device communications has allowed simpler wiring, while smaller, lighter-weight generators and advanced battery chemistries, which allow better performance with lighter weight, are gaining traction.” He points out, however,

that communications themselves don’t really interact, as the navigation systems don’t need generator voltage information, but allowing CAN-style communications to share a single bus “allows devices that do need to communicate with each other to share the same bus as other devices.”

Xantrex targets the boat segment ranging 40-50ft, and here, Don Wilson notes, the power level demands have not changed much, but the demands for quality of power and product reliability have increased. “Air conditions and microwave ovens, which use AC power and DC-powered thrusters remain the largest consumers of onboard power. This hasn’t changed much over the past 10 years, although some more efficient air conditioners have started to emerge.”

By contrast, Armelle Rolland, sales and marketing manager of Cristec, a French company that has been producing energy conversion equipment for the boating market for over 30 years, believes that “the demand for onboard electrical power has about doubled over the past decade.” She says both AC and DC demands keep increasing and this affects all types of boat.

In addition, she says, “we have noticed the regular arrival of trendy and sophisticated comfort, navigation and communication systems which are among the largest consumers. These include water heaters, stream and Jacuzzi type showers, entertainment equipment, underwater lights, and so on.”

Manufacturers of certain types of onboard electrical equipment have optimised efficiency, she points out, with the application of new technology and improvement in electrical standards. “Generators are more powerful and batteries have been offering more autonomy, with the recent introduction of lithium ion batteries.” she notes.

In addition, Rolland says import is the harnessing of environmentally neutral energy sources. “Green energy, including

solar panels, wind generators, hydro-generators, are becoming ever more popular and powerful,” she says. “From our side we have been developing a 500W water generator that can charge up to 40A from 8 knots.”

Lorenzo Cesari, area sales manager at the Italian boat equipment manufacturer Quick, whose products include battery chargers, voltage reducers and charge separators, sees the most significant developments in this sector is CAN-bus technology for data transfer. He also explains: “Can-bus technology and electronic charge splitting through MOSFETS are the two main innovations in the charging system.”

MOSFETS are a type of transistor that can be used for amplifying or switching electronic signals that have a remote on/off facility that protects wiring when using higher voltages.

Cesari also believes that it’s becoming more important to have products suitable to be interfaced with multiplex and popular new electrical systems. “Our battery chargers are equipped with our own protocol CAN-Bus to exchange data with other equipment aboard.”

Like others, although not everyone in this

survey, Lorenzo Cesari observes that “definitely the demand of electric and electronic equipment has increased over the past decade. Customers want to add more and more electric and electronic equipment aboard and the energy system must be sized in accordance to this increased power demand,” he states.

LED lighting technology, he says, “has heavily dropped the power absorption of the lighting system” and notes that these days, probably the electric bow-thruster is the equipment which requires more power. “Electric winches, windlasses and bow-thrusters are now standard in boats of 40ft, so there is a new power demand that was not present 10 years ago,” he says.

LORENZO CESARI | SALES MANAGER QUICK

Definitely the demand of electric and electronic equipment has increased over the past decade

Battery chargers are also the stock-in-trade of French company Reya. From this perspective Nicholas Fata, sales director for its Dolphin Charger brand, comments that one of the most important technical advances in battery chargers has been the development of specific charging programs for new-technology of batteries, such as lithium ion ones.

What's also important here, he says, is the communication of the battery charger with monitoring systems. "We are in contact with many important players such as Naviop in Italy and Marble in the Netherlands in order to make our product 'plug and connect' trouble-free and not requiring an extra expensive communication interface," explains Fata.

An installer's perspective of onboard electrical power is provided by Dutch subcontractor to the superyacht industry Tjssens Elektro. Marcel Pith, the company's manager of software engineering comments: "I would say the most important technical aspect to be aware of in power provision and management is the connectivity and communication with all the onboard installed systems. The more open the systems are to communicate with, the better the outcome for the entire yacht building project."

HOME FROM HOME

Just like others in the survey, Pith notes that many yacht owners today want to have the same experience they have at home as on their yacht. This includes no interruptions and/or fluctuations in power. "They don't want to compromise their yacht experience with flickering lights (harmonic distortion) or failing AV systems because the chef needs to use the galley to its full potential or the captain is docking the yacht," he explains.

Attitudes have changed, he says, from yachts being pleasure boats to "privately-owned luxurious floating hotels, with a fully equipped professional galley and a wellness centre, with good broadband Internet connection and the ability to watch and listen to unlimited supply of movies and music on-demand, all these without the inconvenience of blackouts."

Shore power has also changed: "It has gone from mostly transformers ashore 10 years ago to only shore converters nowadays. That means no more relying on fluctuating shore voltages when the

yacht is moored, with a stable voltage and frequency output to supply the yacht after synchronisation with onboard generators. And of course, even with on shore power the power management system controls power demands," he adds.

One significant trend with shore converters, says Pith, is the transition from air-cooled to water-cooled systems. The move is aimed to reduce the high ambient temperatures around the units, "which otherwise need to be cooled by extra air-handlers, which in turn uses

more power", he says.

The last word goes to Roel ter Heide, owner of Dutch firm WhisperPower, whose speciality is fully integrated systems that can even bring main engines into play with the addition of power generation for onboard systems. His summary of progress in onboard power provision says it all: "Boat size up, power up, quiet operation and high-power inverters and large battery banks for silence at night-time." One could hardly be more succinct. **IBI** ➔

Built to last

**MARINE BATTERY CHARGER
TOUCH SCREEN CONTROL PANEL**

**CAN BUS COMMUNICATION
TOP QUALITY STANDARD
HIGH TEMPERATURE RESISTANT**

em euromaritime
3-4-5 FEBRUAR 2015
PARIS - PORT OF VENISELLES

Dolphin charger

NEW WEBSITE
www.dolphin-charger.com
www.dolphin-charger.com

A-Z of key players in the onboard power sector

THE LATEST LAUNCHES, DEVELOPMENTS AND INNOVATIONS FROM THE INDUSTRY'S LEGION OF POWER SYSTEM MANUFACTURERS



▲ **Keybox by Blink Marine**

BLINK MARINE

Digital switching systems are the speciality of Italian company Blink Marine. Its main product offering for the European boating industry is the PowerKey digital keypad, which it introduced in 2003 for the control of vessels' electrical systems. This was enhanced in 2006 with PowerKey Pro (PKP) that increased its versatility with the addition of removable inserts for a high level of customisation.

The company's latest product is Keybox, a command model specifically for use in vehicles and boats. This small device enables PowerKey users to command various utilities, such as lights, electric motors and bilge pumps, from their keypads.

Following the implementation of CAN-bus protocol into the system, Blink last year extended the application of PKP to wider markets including industrial, automotive and on/off highway.

COELMO

Coelmo is one of the largest European manufacturer of marine and industrial generators. The company has three production plants in Italy and a presence in over 35 countries. It produces marine gensets with outputs from 3.5-40kW, although its industrial units go up to 3,000kVA. It also produces DC and

variable-speed generators.

Recently Coelmo introduced its Integra system which offers boaters a real 'home-like' life experience to boat owners by giving them the freedom to use any onboard electrical devices without having to select the power source. This automatically detects the electrical requirement and chooses the correct, most efficient and environmentally-friendly sources from shore, generator, batteries and solar panels. Integra is also an inverter, battery charger, a UPS and a galvanic insulator that prevents the corrosion of the metal parts of the boats.

CRISTEC

French company Cristec specialises in energy conversion, producing DC and AC onboard power equipment for recreational craft from small cruisers to superyachts. It also serves the commercial craft market, original equipment and refit markets. Automatic battery chargers have been its core business since 1983, but it also produces battery monitors, inverters, converters, isolation transformers, and MOSFET battery isolators.

Cristec has sold more than 100,000 HF chargers and claims market leadership in the medium to high range battery charger segment. The company sells to more than 50 countries in Europe, North and South America, the Middle East and Africa through distributors and its equipment is standard fit with a number of series production boatbuilders including Bénéteau, Jeanneau, Lagoon and Bavaria.

Recently Cristec launched its YPOWER charger range which is universally AC-equipped and automatically detects voltages from 90 to 265VAC/47-65Hz. These units are also designed to charge any type of

battery owing to their microprocessor controlled management, be it GEL, AGM, wet, calcium or lithium. For silent operation these chargers are fan-less and the company claims that it is the only manufacturer to offer this facility on automatic units of up to 500W.

With this new range Cristec has also introduced AC and DC plug-and-play-connection. They are also available with an integrated CAN-bus protocol interface



▲ **Cristec's new YPOWER charger range**

to enable remote monitoring and remote control from any compliant control panels.

At METS 2014 Cristec introduced a new isolation transform to allow the safe powering from ashore without the risk of galvanic corrosion by eliminating any electrical continuity between the boat's AC onboard network and the shore-side supply. To reduce weight and noise, these are toroidal transformers and have an integrated soft start.

DOMETIC

As a world-leading supplier of air conditioning systems for both OEM and aftermarket applications and a major provider of sanitation systems, engine-room ventilation, watermakers, galley equipment, refrigerators, cookers and more, Dometic Marine also offers a large range of high-quality mobile power systems at reasonable prices



▲ **Dometic's WAECO SinePower MSI SinePower MSI**

and with a small product footprint. Its WAECO onboard power units include a wide range of power inverters and battery chargers, charging converters, plus generators and laptop chargers. In addition, Dometic offers the latest in power management, from the by-passable Variable Frequency Drive (VFD), the STIIC (Smart Touch Integrated Intelligence Control), Smart Touch Cabin Control and PerfectControl MPC 01 with Intelligent Battery Sensor (IBS).

Products introduced over the past year include the PerfectCharge MCA series of battery chargers available in a new compact casing line and are operational across the voltage range. These also have a CAN-bus interface, remote control and temperature sensors for better control of the final charge voltage during the charging phases.

Dometic also introduced its MSI line of inverters in compact casings, along with adding features and halving the sales price compared to two years ago. These eliminate the need to purchase modified outputs, use low stand-by current and have mains priority circuits along with the CAN-bus integration, allowing up to three inverters to be connected in parallel and triple power output.

With its intelligent battery sensor the PerfectControl MCP 01 measures the temperature, the effective current and voltage of the batteries and then calculates the capacities and charge status as well as the remaining capacity usage in a countdown.

FISCHER PANDA

The main market for marine generator manufacturer Fischer Panda has always been power and sail boats from 35-80ft, but over the past decade it has developed a presence also in the superyacht market. Today the German company is a strong global player with growing market shares in these segments since the development of its i-series

of compact, light and quiet variable-speed generators. At METS 2014, Fischer Panda introduced the Panda 60i to this range along with the 150i PMS, which it focused special attention. According to sales and marketing director Jens Langer, the 150i represents "a quantum jump in the development of compact and silent marine generators". Langer says this variable-speed 150kVA generator, whose engine speed is automatically regulated depending on the electrical load in a range of 1500-2800rpm, "has about 600-800kg less weight and needs



▲ **Fischer Panda's 150i PMS**

about 30% less space than all other existing silent generators on the global market". He adds, that fuel consumption can be decreased by about 20% during a complete operation cycle. Recognition of these advances earned the 150i a 'Special Mention' in the DAME awards announced at METS 2014.

KOHLER

Kohler is one of the top-selling brands of generators in the global recreational boating market with its range of diesel and gasoline generators that extend up towards 150kW in the former category and from 4-15kW in the latter. In North America, its domestic market, where the vast majority of gensets in small cruisers are gasoline-fuelled, Kohler is market leader by a wide margin. Globally, and most notably in the European market where diesel generators predominate and are generally installed in larger cruisers and superyachts, the company is also growing its market share.

Diesel engines that go into gensets are manufactured in Europe by Lombardini, which Kohler acquired about 10 years ago. Kohler also has plans to build diesel gensets of up 40kW in the US' Midwest,

where Kohler has its headquarters in Wisconsin. Further investment in marine generator manufacturing capacity has been hinted at. Greg Klompenhouwer, Kohler Power's senior product manager for marine market sales, says the company's share is now heading towards 40% worldwide. Engines for the largest marine generators are made by John Deere and Scania.

Although a very significant player in the marine genset market, this accounts for only a minor part of Kohler's overall business portfolio. The company, which employs about 35,000 people and is owned by Herbert Kohler, is one of the largest privately-owned companies in the US. However, its core business is plumbing equipment.

Recent product launches include two EPA Tier 3-compliant diesel models rated at 125-150kW at 60Hz and 100-125kW at 50Hz. Both have smaller footprints than their Tier 2 predecessors. Also new is Kohler's Decision Maker 3500 controller equipped with paralleling and load-management software. This controller better co-ordinates the output



▲ **Kohler's Decision Maker**

of both units with load in order to avoid under-loading and over-fuelling and can be operated in three paralleling modes. By providing higher output and greater operating efficiency, such paralleling can also have space-saving advantages.

MASE GENERATORS

Italy's Mase Generators claims to be the fourth largest producer of marine generators in the 2-100kW sector of the leisure market, and also for commercial craft in range 6-200kW. It also produces electronic battery chargers in the range 15A at 12V to 140V at 24V.

The company has a new IS generator series (2-40kW) mounted on a specially designed double chassis to stop

vibrations from being transmitted to the boat and fully enclosed case that significantly mutes transmitted noise. Additionally, because the genset is cooled only by water through a seawater/air heat exchanger, it is said not to radiate heat into the space in which it is installed.



▲ Mase Mariner 1200

Also new is a heavy-duty Mariner series genset with outputs from 6-200kW for commercial and professional applications. This has a CBU control unit that is designed to spare the engine of the generator and connects the generator with the other onboard equipment by CAN-bus. A new TFT touch screen manages generators and battery charger together.

New Mase battery chargers are the Mase Star (15-140A). This has an internal backup system in case of failure.

MASTERVOLT MARINCO

Since 2010 Mastervolt, a leading manufacturer of onboard electrical power equipment based in the Netherlands, has been teamed with Marinco, a top US brand of a wide range of electrical equipment for boats, but not until this now privately-held company acquired it this year. Mastervolt Marinco supplies power products to leisure marine markets ranging from small

boats to 180ft superyachts varying from power inlets, AGM batteries and electric propulsion for the smaller boats, via complete power management solutions to large backup systems with the latest lithium ion battery technology for bigger boats.

The portfolio has been extensively developed with a raft of product launches over the past year or so. These include CZone digital switching, the MLI Ultra lithium ion battery, Pro Installer EZ-Mount, the Mass Combi Ultra charger/inverter combination, and Easy Charge battery chargers.

CZone was developed by sister company BEP in New Zealand. The company is now introducing new displays and has added a WiFi module which allows remote control. These have been taken up by Garmin and Navico and integrated into their glass bridge navigation and monitoring suites of boating instruments.

MLI Ultra uses the latest generation of lithium ion battery technology with integrated BMS and smart-shunt. All seven Volvo Ocean Race boats are currently equipped with 2x5000Wh MLI Ultra's each along with CZone switching.

The EZ-Mount Switch series features ease of installation and flexibility, optimal performance and rugged construction and can be wired from the front.

The new Mass Combi Ultra integrated charger/inverter has two AC inputs and two AC outputs, a solar (MPPT) charger and a secondary battery charger. It offers the possibility to run parallel and three-phase power up to 30kW.

Finally, EasyCharge chargers are a new range of lower power chargers (1,1,4,6 and 10A) for the retail market. All models are IP65 protected and more are scheduled to follow during 1015.

MZ ELECTRONIC

In spite of its name, MZ Electronic has expanded in recent years to embrace mechanical products, notably Italwinch, a well-known brand of windlasses, which was the result of this Italian company's acquisition of ORVEA in 2009. The common theme here is precision engineering and the ability to custom build. It's onboard power offering centres around the Sinergex brand, which encompasses power conversion products such as DC to AC inverters.



▲ MZ Electronic's Energy battery charger

The Sinergex PureSine series II inverters are the latest addition to the range. These new lightweight and efficient inverters are built on the precision of the original Sinergex PureSine series, but have added features and increased performance. It produces pure sine wave power for smooth operation without buzzing or humming and have increased surge capabilities for starting tough loads. A Powersaver mode adds to its efficiency.

The PureSine Series II inverters include models from 350W to 3,00W. All PureSine II power inverters include a remote control switch.

Also offered by MZ is the Sinergex Fusion inverter/charger. These are programmable, enabling them to deliver precise charging to battery manufacturers' specifications.

NORTHERN LIGHTS

The primary business focus of Northern Lights, is fully customised marine diesel power generation packages for the superyacht segment. Although the Seattle-based company has a standard product offering, it is known for custom engineering and solutions for all type of vessels looking for specific applications and/or operational profiles. Its newest market sector is hybrid marine systems and, in particular, variable-speed power generation systems. ➔



▲ Northern Lights M1306 genset



▲ Mastervolt CZone digital switching

The company has expanded its product line and now offers generators of over 500kW. "As our customers' vessels have grown in size we have taken strides to grow as well," says Colin Puckett, vice president of sales and marketing, and now provides systems to a much broader range of marine power customers.

QUICK

In addition to thrusters, windlasses and lighting products, Quick's varied specialist offering of technical products for the boating market also includes battery chargers, voltage reducers and charge separators. OEM customers for its chargers include Azimut Yachts.

Quick's latest offering is a battery charger range called NRG. This spans 13 models from 12-100A which are designed to provide up to 92% efficiency.

Main features of its battery chargers include integrated charge separator, single protection fuses for each output, working temperature range up to 70°C, integrated multi-language control panel, CAN-bus interface for data transfer, Digital Current Sharing to parallel up to three battery chargers, a temperature compensation system to control up to 128 temperature sensors and automatic and manual power derating.



◀ **Quick SBC1200 battery charger**

REYA

With its three ranges of Dolphin battery chargers, French company Reya covers all sectors of the maritime industry. Dolphin Premium series chargers from 10-60A are suitable for all areas of the recreational boating. The Dolphin Pro series (60-100A) chargers are targeted at larger yachts, while the recently launched Dolphin Pro HD+ (also 60-100A) range is designed for the superyacht, workboat and patrolboat markets is expecting to receive DNV certification in 2015.

The company claims market leadership in its sector in France and southern Europe, but it is also active in the Middle East and Asia.

At METS 2014 Reya launched its Dolphin DC/DC battery booster, which can fully charge 24V batteries from a 12V source, be it a battery or an alternator.



▲ **Reya's Dolphin battery charger**

This unit is expected to appeal to owners of boats with 12V power who wish to power 24V bow thrusters.

The new models are equipped for CAN-bus communication to serve the demands of more than 15 electrical AC and DC appliances and turn them from simple chargers into full electrical data management centres.

STUDER INNOTEK

Swiss company Studer Innotek produces inverters and chargers for boatbuilders and the aftermarket. Its latest offering for onboard applications was introduced in 2011. The range includes three inverter-chargers designated XTS that produce 900 to 1400VA outputs housed in IP54 casings. These units provide up to three-times nominal power to cope with peak demand. They are also highly flexible in application, being capable of handling up to 500 electrical parameters and are likely to cover all boating application requirements.



▲ **Studer's Xtender Multi Power**

TIJSSEN ELEKTRO

Tijssen Elektro is a major electrical systems subcontractor to the European superyacht building industry. As a turn-key supplier it provides all electrical engineering for power distribution, along with navigation, communication and audio/video systems alarm, all controlled and monitored by its signature product, the MPA system.

Heeding to feedback captains and yacht engineers, it has been continually improving its MPA. Last year it also

expanded and improved its power management system component to accommodate higher power demands and interface opportunities with other onboard systems.

The company has also integrated a filter into the power management process to measure and rectify harmonic distortion caused by electricity consumers such LED lights, transformers and frequency controllers. This also balances three-phase loading to improve generators performance.



▲ **Tijssen's power management system**

VOLPI TECNO ENERGIA

Volpi Tecno Energia (VTE) specialises in producing light and compact generators in the 2-16kW range. Since 2001, It has specialised in permanent magnet technology and in the past two years it has developed two new variable-speed models running at 1,800rpm up to 3,000rpm. These generators are more compact and lighter than traditional designs.

VTE claims they are the lightest and smallest on the market in their power range. Its Paguro 2000 model (2kW) weighs 46kg while its Paguro 5000 (4 kW) only 83kg. Space and weight savings are largely helped by the compact design of the units' alternator cooling system.

WESTERBEKE

US inboard diesel specialist Westerbeke also manufactures marine generators. Historically, its main market has been recreational boating, but in recent years it has focused more on the commercial and military sectors. Richard Westerbeke, international sales manager, says the company is well positioned in these markets "since the military requires a company that can supply both gasoline and diesel generators for its defence

vessels. These use both diesel and gasoline, depending upon the fuel used by the main engines.”

Westerbeke offers the commercial sector the alternative of electronic (digital) diesel generators or traditional analogue product. “While many customers may prefer the latest technology, particularly in the pleasure industry, some prefer traditional product for its simplicity and are often commercial customers such as fishermen,” Westerbeke explains.

Over the past year the company has introduced four new diesel generators - the 6.5kW D-NET electronic 6.5 EDT and 11kW 11.0 EDT, which are available with optional NMEA 2000 certification.

WHISPERPOWER

Dutch company WhisperPower was founded in 2009 by its owner Roel ter Heide after he and his brother had sold the Mastervolt power inverter and charger company that they had built up to US diversified industrial products group Actuant. “We are steadily moving up to pole position in the field of integrated solutions for boats ranging 30-120ft. Our specialty is that we can make power by running (temporarily) a diesel engine, or even utilising the main engine, and convert this into a generator by adding a fly wheel generator,” ter Heide says. He claims the company produces the smallest units per kW output, the quietest and the most integrated on-board power systems.

Fifty per cent of the company’s business is in recreational marine, 55% is commercial, and 25% is other mobile power and remainder off- grid remote power solutions. All sectors have proved to have good growth potential for WhisperPower. “Marine recreational is growing fast for us, and better than expected as we gain market share and take on new territories like Asia, China and South America,” ter Heide says.

New WhisperPower products include its Piccolo diesel generator of 4kW and a new All-in One series launched at METS 2014. These combine a premium hybrid diesel generator equipped with a high-efficiency permanent magnet



▲ Whisperpower’s power station

alternator. This highly-compact generator works together with a sine wave inverter, battery charger or Combi unit connected to long-life onboard batteries.

Also launched at METS was SQ 27 1,500rpm generator system with twin units operating in parallel to 50kW of power in peak load periods and 25kW during low consumptions hours. Coming soon will be a new Genverter 150kW programmable speed generator. Units can be paralleled to over 1 megawatt.

XANTREX

Xantrex is a world leader in power electronics products for mobile applications and claims to have introduced several category defining products in this sector. These include the PROsine inverter, one of the first pure sine wave inverters launched in late 1990s. It recently launched the Freedom sine wave series, a 230Vac/50Hz combination inverter, battery charger and transfer switch designed to provide fully automatic electrical power management for commercial and recreational applications. Standard features include automatic overload protection, short-circuit protection, integrated resettable AC breakers and a power factor-corrected, multi-stage charger with temperature compensation and a wide operating range for fast, efficient charging in tough climate conditions. The Freedom SW 230VAC offers parallel stacking capability to

double the power output. Built-in Generator Support Mode (requires AGS) enables the Freedom SW to supplement an onboard generator when AC loads exceed the generator’s capacity. **IBI**



◀ Xantrex’s Freedom inverter



Seafari Quest Watermaker
Up to 95 l/h in 12/24 Volt DC
Compact design for CATs
Modular for Monohulls

Horizon Reverse Osmosis (HRO) is the brand European boat builders trust the most. The HRO Quest watermaker gives now even more advantages such as energy and space saving, lighter weight loads, and unlimited fresh water. Best of all, HRO systems add to your boats the benefit of true independence at sea for your sailor clients. A complete sailboat is a sailboat with an HRO watermaker.

Call us to find out more about our line of watermakers.

Phone: +1 (310) 608-5600
Find a dealer: www.hrosystems.com

