

ODYSSEY[®] BATTERY

ODYSSEY[®] Marine Battery Solutions

PC1800-FT

- The battery of choice for hybrid applications
- High cycle life: 1,800 cycles to 50% DOD
- Ability to taxi both to and from moorings using battery power; helping to increase fuel savings and reduce carbon footprint



31M-PC2150

- Dual purpose - Deep cycle (400 Cycles to 80% DOD) and high cranking 1150A ability
- High crank capability delivering reliable engine even when discharged up to 70%
- Extreme temperature operating range; will work up to +80°C



34M-PC1500

- Cranking ability best in class (CCA = 850A, equivalent to batteries of twice the weight)
- Universal footprint offering a Plug and Play replacement for other BCI Group 34 batteries
- Ideal for engine start in critical applications, such as emergency lifeboats

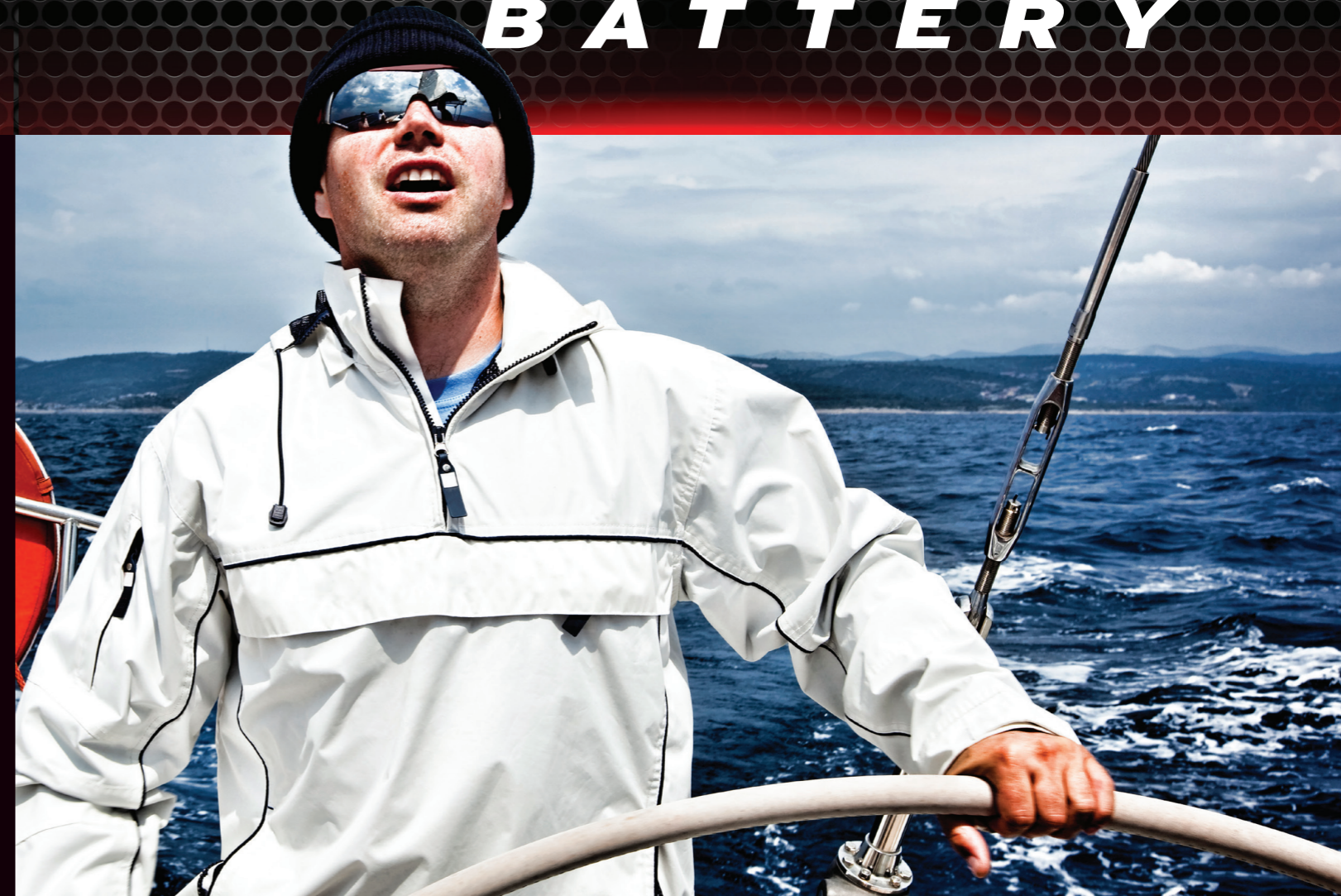


PC2250M

- Ability to operate in extreme conditions (even down to -40°C)
- Very high vibration resistance
- More power in the same or smaller size footprint without losing performance



For the entire range of products available, please see the ODYSSEY Extreme Series™ Range Summary that is available at www.odysseybattery.com



www.odysseybattery.com
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The reliable, robust, efficient and cost effective battery of choice!



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www.odysseybattery.com www.enersys.com



Reduce fuel costs and achieve zero emissions with advanced EnerSys[®] TPPL battery technology for all of your hybrid small craft power solutions

Today's modern boats are becoming more power demanding; standard equipment can now include navigation systems, lights, washing machines, electric ovens, induction hobs and even air-conditioning.

EnerSys[®] has developed a cost-effective battery solution for a range of hybrid powertrains using the latest Thin Plate Pure Lead (TPPL) technology in its ODYSSEY[®] range of marine batteries. This tried and tested technology is widely used in the telecommunications industry for running cell phone systems in off-grid areas, and was specifically developed for hybrid systems used in the harshest conditions and environments - so ideal for the demands of marine applications.

Hybrid systems using the ODYSSEY range of batteries maximise the efficiency of internal combustion (IC) engines, reducing fuel costs and giving the vessel the ability to run with zero emissions when required. An electric motor powered by the ODYSSEY battery bank drives a propeller. When the IC engine is running it is able to drive the propeller and recharge the battery, maximising its own efficiency. When under sail, the normally redundant propeller is used to transfer power back to the battery bank to recharge - with TPPL technology this means a full charge from flat

can be achieved in less than one hour under optimal conditions. Other renewable sources of energy can also be used to increase the efficiency and electrical load capacity.

In order to meet the demands of modern hybrid systems, the ODYSSEY range of marine batteries are large enough to accommodate long run times to maximize the running efficiency of the engine. They can also operate for long periods of time in a partial state of charge without great degradation in performance. In addition, the high charge acceptance capability of the ODYSSEY range ensures that when the IC engine is running, the battery is recharging, further extending the life of the battery.

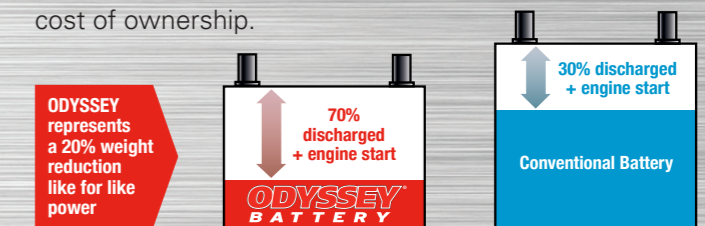
The capital cost per kWh for the ODYSSEY is extremely cost-effective when compared to other battery chemistries, so the savings achieved justify the use of a hybrid system. The battery has proved to be reliable and robust in service, and is a critical component in a complete system that offers cost savings, increased electrical power, convenience and even luxury to today's craft users - meaning that the ODYSSEY range is truly the reliable, robust, efficient and cost effective battery of choice!

Reliable power and increased reserve capacity

ODYSSEY[®] Extreme Series[™] and its Thin Plate Pure Lead (TPPL) technology brings significant improvements to battery life and reliability.

EnerSys[®] has developed a unique manufacturing process to create thin plate pure lead grids that measure less than one millimetre, whilst still providing deep cycle capability. Using thin plates improves power density, i.e. gives more power in the same volume and mass, as more plates can be fitted in the same-sized cell. Using a stronger acid in the battery further enhances power density.

Advanced TPPL batteries are totally maintenance-free during their anticipated design life. Thanks to very low self-discharging the TPPL batteries also store well with an enhanced shelf life between refresh charges. This effortless maintenance also contributes to a lower total cost of ownership.



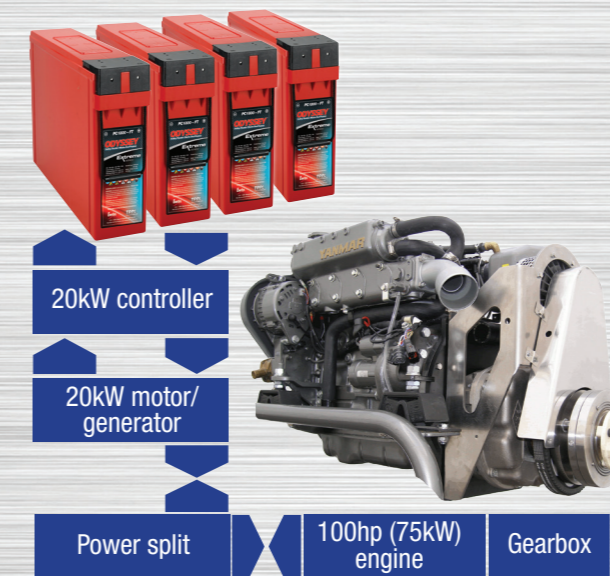
"At Hybrid Marine we have been developing award winning marine hybrid power and propulsion systems for over ten years"

"In close co-operation with EnerSys, Newport we have developed practical charging algorithms for the TPPL batteries. Due to the low internal resistance of the ODYSSEY batteries we are able to charge at high current to optimally load our hybrid generators. This has enabled us to improve overall efficiency of our systems.

"We have found ODYSSEY batteries reliable and robust in service and they are our recommended battery of choice for all our seagoing hybrid systems."

*Graeme Hawksley
Managing Director, Hybrid Marine Ltd.*

"Hybrid Marine has performed extensive research into regeneration of energy from freewheeling propellers (sailing boats). Sophisticated algorithms have been developed that allow use of many propeller types when charging TPPL batteries.



Typical hybrid power and propulsion system developed by Hybrid Marine Ltd.

