
Today's complete electric
propulsion systems
GreenStar
marine

To glide in silence

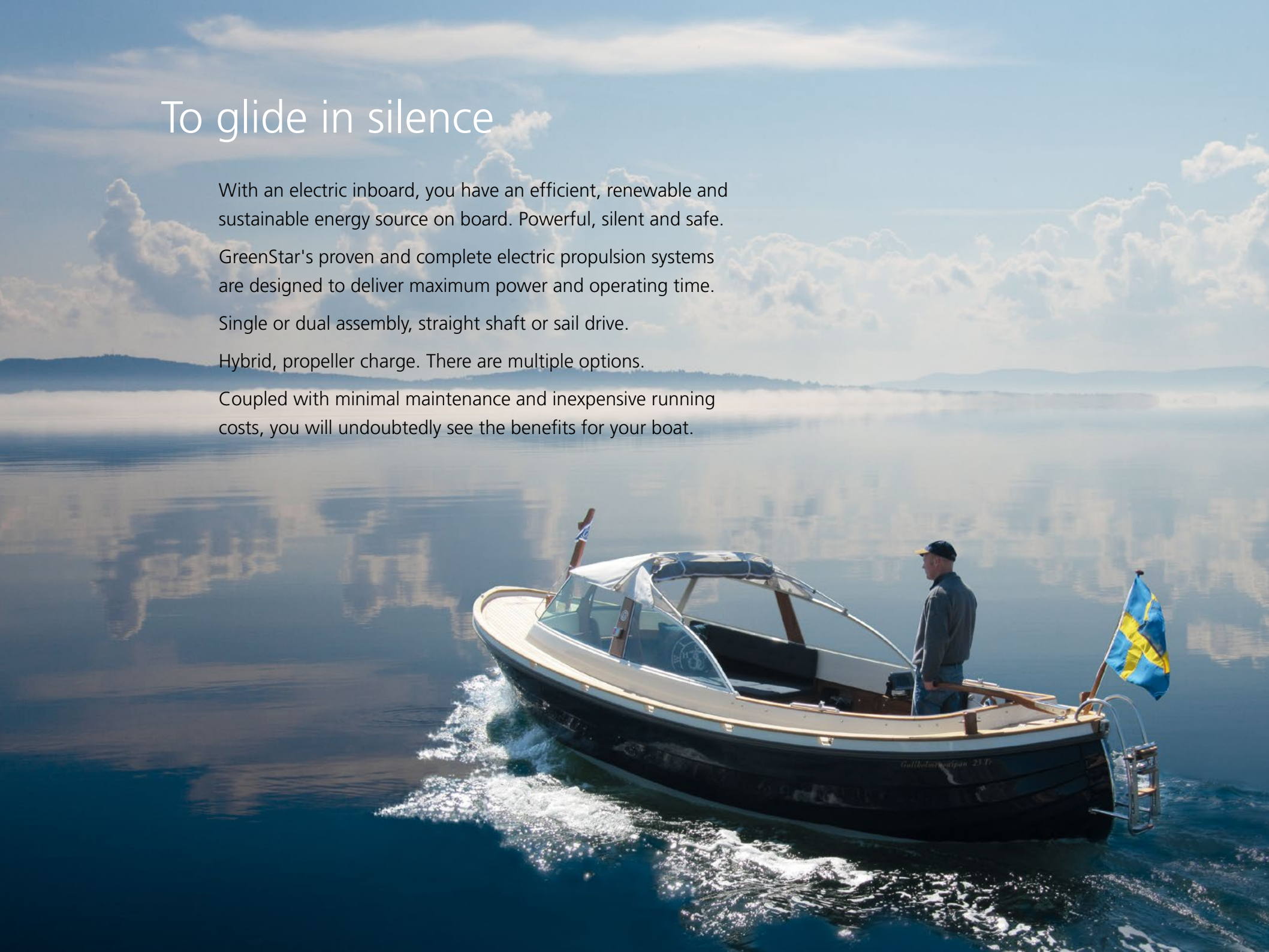
With an electric inboard, you have an efficient, renewable and sustainable energy source on board. Powerful, silent and safe.

GreenStar's proven and complete electric propulsion systems are designed to deliver maximum power and operating time.

Single or dual assembly, straight shaft or sail drive.

Hybrid, propeller charge. There are multiple options.

Coupled with minimal maintenance and inexpensive running costs, you will undoubtedly see the benefits for your boat.



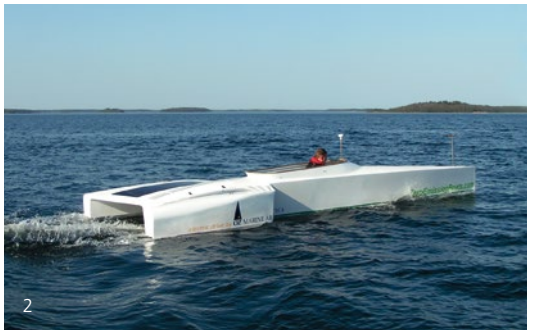
CONTENTS

TECHNOLOGY	6 - 7
ECOCHARGE	8
HYBRID	9
BATTERIES	10
MOTOR OVERVIEW	11
SYSTEM	12 - 15
INSTALLATION	16
COMPARISON TABLE	17

GreenStar marine

With sufficient power when needed

Our motors are constant speed controlled, which means that they maintain their speed almost regardless of load. This provides a quiet smooth propulsion while allowing the motor to supply more power when needed and less when it is not needed. In high seas, the motor is far stronger moving up the swell than on the way down. The motors' high torque enables them to carry a propeller with a large blade area. This in turn provides a great deal of power that is also direct. This is especially noticeable in difficult wave and wind conditions and when manoeuvring in port.

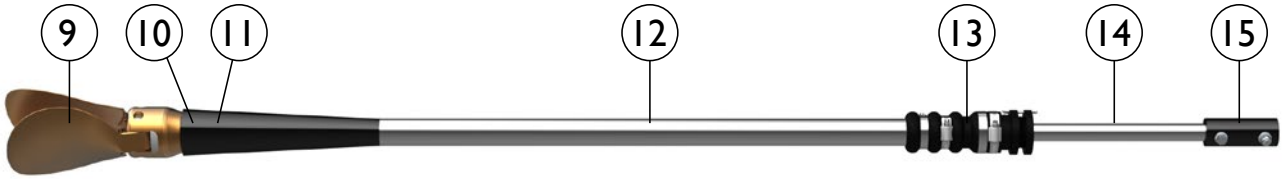


Examples of boat models that have chosen to use the GreenStar electric propulsion system.

1. Biehl 8.8 Daysailor, GS10. **2.** ZEB 25, GS18. **3** R10, GS36D. **4** Westfjord 26 fishing Hybrid, GS20D +110 hp diesel motor. **5.** Dragonfly 32, GS18. **6.** Scangaard 21, GS10. **7.** HP1030, GS10. **8.** Ocean One, GS36D. **9.** Jens 28 Hydro hybrid, GS18 + 75 hp diesel motor.

How the GreenStar system works

GreenStar is not just an electric motor; it is a complete system. For us, a system means that everything from propellers to plugs are included and that they interact well. Getting there is not easy and is hampered by numerous obstacles, which are overcome by using combination of custom designs and standard products. A complete GreenStar system contains everything required to get an empty hull moving, including the propellers, shaft seals, motor, motor bracket, speed control, shore power system, cables, and fuel gauge. The only thing not included is the batteries.



9. Propeller

Folding
Manufactured and customised for us by Flexofold. Prepared for our sacrificial anodes. Design optimised for both our existing stern tubes and stern tubes already on the market.

Fixed
Fixed propeller for motorboats and for customers who do not want a folding propeller.

10. Sacrificial anode

GSM - Designed to minimize the growth of barnacles on the propeller.
Zinc anodes are also available for customers who are unaffected by fouling or for those wanting a more traditional sacrificial anode.

11. Axle bearing

Offering significantly lower friction than traditional bearings. Able to be run dry on land e.g. when conducting system functionality checks prior to launching.

12. Stern tube

Standard
For fully integrated propeller shafts or suspended shafts with fixed propellers.

Cone
For suspended propeller shafts with folding propellers.
The hydrodynamic design makes the propeller more efficient when running and charging whilst simultaneously providing reduced drag resistance when sailing. The cone makes it harder for ropes and other objects to become caught in the propeller.

13. Axle seal

Completely oil and grease free.
Due to its low friction, it is durable and does not wear on the propeller shaft.

14. Propeller shaft

Stainless steel
25mm

15. Axle coupling

Provides an extremely straight connection between the motor and propeller shaft.
The penetrating bolts ensure a very secure connection between the motor and propeller shaft.

1. SpeedShift speed control

Clear fixed steps offer control over energy consumption. Increasing the speed by one notch effectively halves the remaining running time.
Built-in LED and buzzer provide clear information for the user.
The neat recessed design enables the controls to be ideally placed and offers good protection from shocks, feet and ropes.

2. SpeedShift ecoCharge

Built-in LED and buzzer provide clear information about charging progress.
The control dial gives you completed control over the charging process.

3. SpeedShift central unit

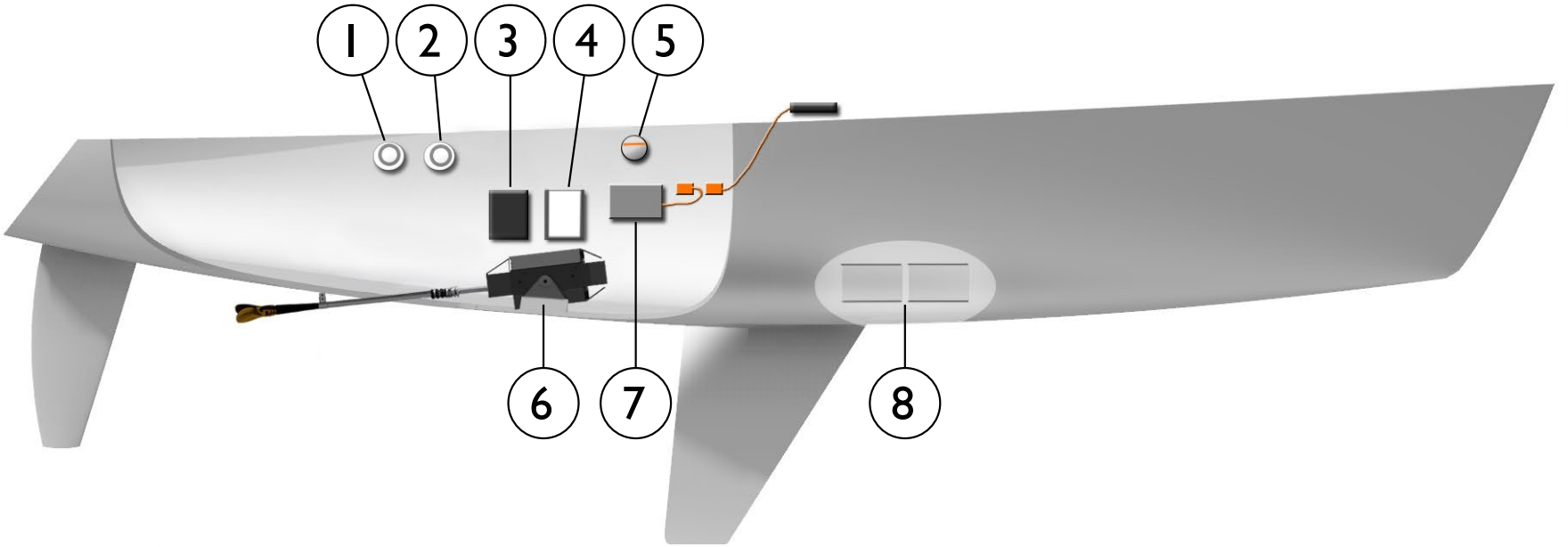
The heart of the entire boat's electrical system.
- Battery balancing
- Plug & Play
- 12 V output

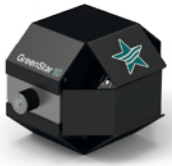
4.Battery charger

Fully automatic.
Adjustable for different battery types.

5. Battery monitor

The boat's fuel gauge shows:
- Percentage remaining
- "Time to go"
- Consumption
- Voltage





6. Motor

Power range of 3.6 kW - 7.1 kW.
Includes motor bracket.

7. Shore power system

Complete system with RCD and cables etc.

8. Batteries

Lithium or lead.
Tailored to the system according to make and quantity.

Cables

Flexible, durable, multi-stranded and tin-coated neoprene cables are always included in a Green-Star system.

EcoCharge propeller charging

Charge the batteries while sailing

Our systems have been developed with a focus on efficiency and ease of use and enable you to recharge your batteries while sailing. Do you want to travel in silence despite moving under power, while also contributing to a better environment?

EcoCharge description

- Our patented EcoCharge technology allows efficient charging while sailing.
- EcoCharge works with both fixed and folding propellers.
- Simple and clear charge control makes finding optimum charging for your boat simple.
- You have control over when you want to charge and when you want to sail at full speed.
- For displacement hulls and in moderate breeze, the disruption when sailing is marginal.
- At low speed, charging is already far more efficient than a 100 W solar panel.
- Built-in overcharge protection and maintenance charging means the batteries cannot be overcharged even when charged continuously over several days.
- The system's speed control always takes precedence over charging, which means that the motor is directly available even while charging.
- Charging increases sharply with increasing boat speed but is electronically limited up to 100 A.
- Charging is effective when the boat is moving at around 4 ½ knots or more.

Hybrid

Electric drive sometimes does not suit or meet your needs and requirements. This may be because the boat and how it is used requires more energy than can be practically stored in batteries or that there is no natural charging station.

Internal combustion engines are ideal for converting energy-rich petroleum or diesel fuel into electrical energy. Electric motors are better all-round at powering boats. A hybrid system that uses a combustion engine to charge the batteries and an electric motor to propel the boat offers the best of both worlds.

A small portable petrol generator can be ideal and an inexpensive solution for those who normally survive on pure electric power, but who occasionally have to travel really far.

A stationary diesel generator is for those who want a more permanent solution, operating quietly and economically, and is also able to supply the entire boat with 230 V to power the fridge, oven, lights etc. This way, there is no need for gas on board...

A hybrid system also opens new doors in terms of the boat's layout. Instead of having a large diesel motor installed under the cockpit, the system now consists of a number of smaller components that can be positions in the boat with greater freedom.

Batteries

The need for good batteries on an electric boat may seem obvious, but what determines really good batteries and what type of battery will best suit your needs? There are suitable and less suitable batteries for an electric boat available on the market. We have done most of the work for you and selected batteries that meet our strict requirements for suitable batteries.

At present there are basically two types of battery: lead-acid and lithium.

GreenStar Lead Batteries

Lead-acid batteries are suitable for those who need weight in the boat, or do not want to spend too much money on batteries initially.

We are strong proponents of deep cycle AGM batteries, i.e. batteries that can withstand being drained while also being able to deliver large amounts of current in a short space of time, and that also supply a large proportion of their energy content under heavy loads over time. Used correctly, these batteries will last for many years. In addition, they are easy to house since they can be tilted in any direction and do not need to be kept in ventilated compartments.

The size of the battery bank should at least be such that you would normally never use more than half of its energy content. This also means that in the event of an emergency, e.g. 1-2 times per season, the batteries can run for much longer than normal. Following a total discharge, it is vitally important that the batteries are charged immediately to ensure that they are not damaged permanently.

GreenStar Lithium Batteries

Lithium batteries are suitable for those who want maximum performance, to save weight, sail a lot and who want to charge their batteries quickly. Lithium batteries cost more but are virtually indestructible.

Just as with lead-acid batteries, there are various types and levels of quality available on the market. Our Lithium batteries are the Lithium Iron Phosphate variety (LiFePO4), which is stable and safe compared to many other types.

With lithium batteries, it is extremely important to have full control over each individual battery cell's charging status. Our batteries monitor each individual cell, but not many lithium batteries on the market do this. Furthermore, our batteries are able to communicate, which makes it possible to receive battery data directly on a plotter, for example. Our lithium batteries are among the most sophisticated, high-performance, safe and easy-to-use lithium batteries on the market.

The size of the battery bank is typically not greater than what is required on a daily basis, i.e. half the size of what would be required when using a lead-acid battery bank.

Motors

GS10 Motor

Motor type: High torque multi-polar permanent magnet DC motor with brushes. The compact design enables installation in confined spaces.

- Continuous input power: 3.6 kW
- Maximum input power 4.8 kW
- Continuous torque: 27 Nm
- Maximum torque: 40 Nm
- Maximum static thrust: 100 kp
- Speed: 1150 n/min or 1320 n/min depending on the model with or without propeller charging
- Weight: 14 kg
- Dimensions B 305 H 230 L 300
- Voltage: 24 V
- Equivalent: 10 hp diesel motor
- Self-adjusting motor bracket for easy installation
- Built-in thrust bearings for greater efficiency and easy installation

GS18 Motor

Motor type: High torque multi-polar permanent magnet DC motor with brushes. The compact design enables installation in confined spaces.

- Continuous input power: 5.8 kW
- Maximum input power 9.6 kW
- Continuous torque: 40 Nm
- Maximum torque: 76 Nm
- Speed: 1320 n/min
- Weight: 32 kg
- Dimensions B 420 H 230 L 510
- Voltage: 48 V
- Equivalent: 18 hp diesel motor
- Self-adjusting motor bracket for easy installation
- Built-in thrust bearings for greater efficiency and easy installation

GSSD10 Motor

Motor type: High torque multi-polar permanent magnet DC motor with brushes. The compact design enables installation in confined spaces.

- Continuous input power: 3.6 kW
- Maximum input power 4.8 kW
- Continuous torque: 27 Nm
- Maximum torque: 40 Nm
- Maximum static thrust: 100 kp
- Speed: 1200 n/min
- Weight including drive but excluding propellers: 30 kg
- Dimensions B 385 H 309 L 385
- Voltage: 24 V
- Equivalent: 10 hp diesel motor
- Drive with thin profile for greater efficiency and low drag resistance.
- Includes an adapter plate that fits on most motor base plates on the market

GSSD22 Motor

Motor type: Permanent magnet brushless AC synchronous disk motor. The compact design enables installation in confined spaces.

- Continuous input power: 7.1 kW
- Maximum input power 14.4 kW
- Continuous torque: 38 Nm
- Maximum torque: 80 Nm
- Speed: 1350 n/min
- Weight including drive but excluding propellers: 46 kg
- Dimensions B 385 H 313 L 385
- Voltage: 48 V
- Equivalent: 22 hp diesel motor
- Drive with thin profile for greater efficiency and low drag resistance.
- Includes an adapter plate that fits on most motor base plates on the market

GreenStar 10™

GreenStar 10 is a complete system with a straight shaft built around our smallest motor, the GS10. With a complete package like this, you will benefit from everything that a GreenStar system represents. The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.

You choose whether you want a fixed or folding propeller and if our EcoCharge propeller charging is to be included.

All that remains to have a working boat is batteries. The quantity is determined according to your needs. GreenStar 10 is normally installed on sailing boats with a maximum weight of 3,500 kg or motorboats with a maximum weight of approx. 1,500 kg.

GreenStar 18™

GreenStar 18 is a complete system with a straight shaft built around our GS18. With a complete package like this, you will benefit from everything that a GreenStar system represents.
The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.

You choose whether you want a fixed or folding propeller and if our EcoCharge propeller charging is to be included.

All that remains to have a working boat is batteries. The quantity is determined according to your needs.
GreenStar 10 is normally installed on sailing boats with a maximum weight of 7,000 kg or motorboats with a maximum weight of approx. 3,000 kg.

GreenStar 20D™

GreenStar 20D is a complete system with dual straight shafts and dual GS10 motors.
The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.

Choose between fixed or folding propellers and whether to include our EcoCharge propeller charging.
All that remains to have a working boat is batteries. The quantity is determined according to your needs.

The motors can be operated entirely independently of each other, providing superb manoeuvrability in tight spaces.

GreenStar 20D is perfect for multihulls and monohulls with dual motors. GreenStar 20D is normally installed on sailing boats with a maximum weight of 7,500 kg or motorboats with a maximum weight of approx. 3,500 kg.

GreenStar 36D™

GreenStar 36D is a complete system with dual straight shafts and dual GS18 motors.
The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.

Choose between fixed or folding propellers and whether to include our EcoCharge propeller charging.
All that remains to have a working boat is batteries. The quantity is determined according to your needs.

The motors can be operated entirely independently of each other, providing superb manoeuvrability in tight spaces.

GreenStar 36D is perfect for multihulls and monohulls with dual motors. GreenStar 36 is normally installed on sailing boats with a maximum weight of 15,000 kg or motorboats with a maximum weight of approx. 7,000 kg.

GreenStar SD10™

GreenStar SD10 is a complete system with our GSSD10 motor. With a complete package like this, you will benefit from everything that a GreenStar system represents.
The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.
You choose whether you want a fixed or folding propeller and if our EcoCharge propeller charging is to be included.

All that remains to have a working boat is batteries. The quantity is determined according to your needs.
GreenStar SD10 is normally installed on sailing boats with a maximum weight of 3,500 kg or motorboats with a maximum weight of approx. 1,500 kg.

GreenStar SD22™

GreenStar SD22 is a complete system with our GSSD22 motor. With a complete package like this, you will benefit from everything that a GreenStar system represents.

The system, which is naturally Plug & Play, comes complete with motor, controls, battery charger, battery monitor, shore power system and everything else required.
You choose whether you want a fixed or folding propeller and if our EcoCharge propeller charging is to be included.

All that remains to have a working boat is batteries. The quantity is determined according to your needs.
GreenStar SD10 is normally installed on sailing boats with a maximum weight of 7,500 kg or motorboats with a maximum weight of approx. 3,500 kg.

GreenStar 10X™

GreenStar 10X is a basic package for straight shafts with our GS10 motor. The system is for customers who want to keep their old shaft and the existing charging system.

GreenStar 10X is normally installed on sailing boats with a maximum weight of 3,500 kg or motorboats with a maximum weight of approx. 1,500 kg.

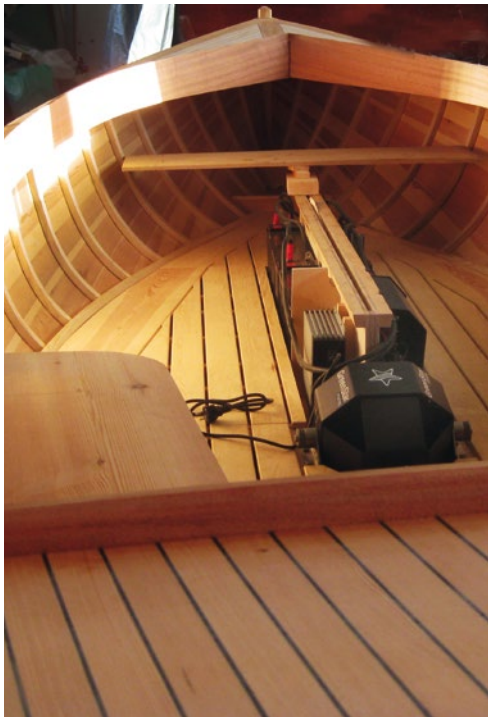
GreenStar 18X™

GreenStar 18X is a basic package for straight shafts with our GS18 motor. The system is for customers who want to keep their old shaft and the existing charging system.

GreenStar 10 is normally installed on sailing boats with a maximum weight of 7,000 kg or motorboats with a maximum weight of approx. 3,000 kg.

Installation

GreenStar Marine's products are designed with simple and user-friendly installation in mind. Notably, the self-adjusting and rubber mounted motor brackets for the GS10 and GS18 help to make installation simple and inexpensive. SpeedShift's recessed controls are well protected and can be located where they are easily accessible. The small details are what make the difference...



Example of custom installation.

1. System centred around the centreboard drum of a JB Sailor. **2.** Speed control fitted to the control panel of a Gullholmensnipa. **4.** Battery monitor and speed control installed in the bulkhead. **5.** Motor system installed in former motor well of a Crescent boat, with hatch.

Comparison table

The table shows what the systems include. It is obviously possible to combine the systems based on your personal requirements.

	GreenStar 10	GreenStar 18	GreenStar 20D	GreenStar 36D	GreenStar SD10	GreenStar SD22	GreenStar SD20 D	GreenStar SD44 D	GreenStar 10X	GreenStar 18X	GreenStar SD10X	GreenStar SD22X
GS10 motor	☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐
GS18 motor	☐	☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐
GSSD10 motor	☐	☐	☐	☐	☑	☐	☑	☐	☐	☐	☑	☐
GSSD22 motor	☐	☐	☐	☐	☐	☑	☐	☑	☐	☐	☐	☑
Motor bracket	☑	☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☐
Axle coupling	☑	☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☐
Propeller shaft	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐
Axle seal	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐
Stern tube (with or without cone)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Axle bearing	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐
Sacrificial anod	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Propeller (fixed- or folding)	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
SpeedShift central unit & speedcontrol	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
EcoCharge	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Cables	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Battery charger	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Battery monitor	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Shore power system	☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Batteries	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

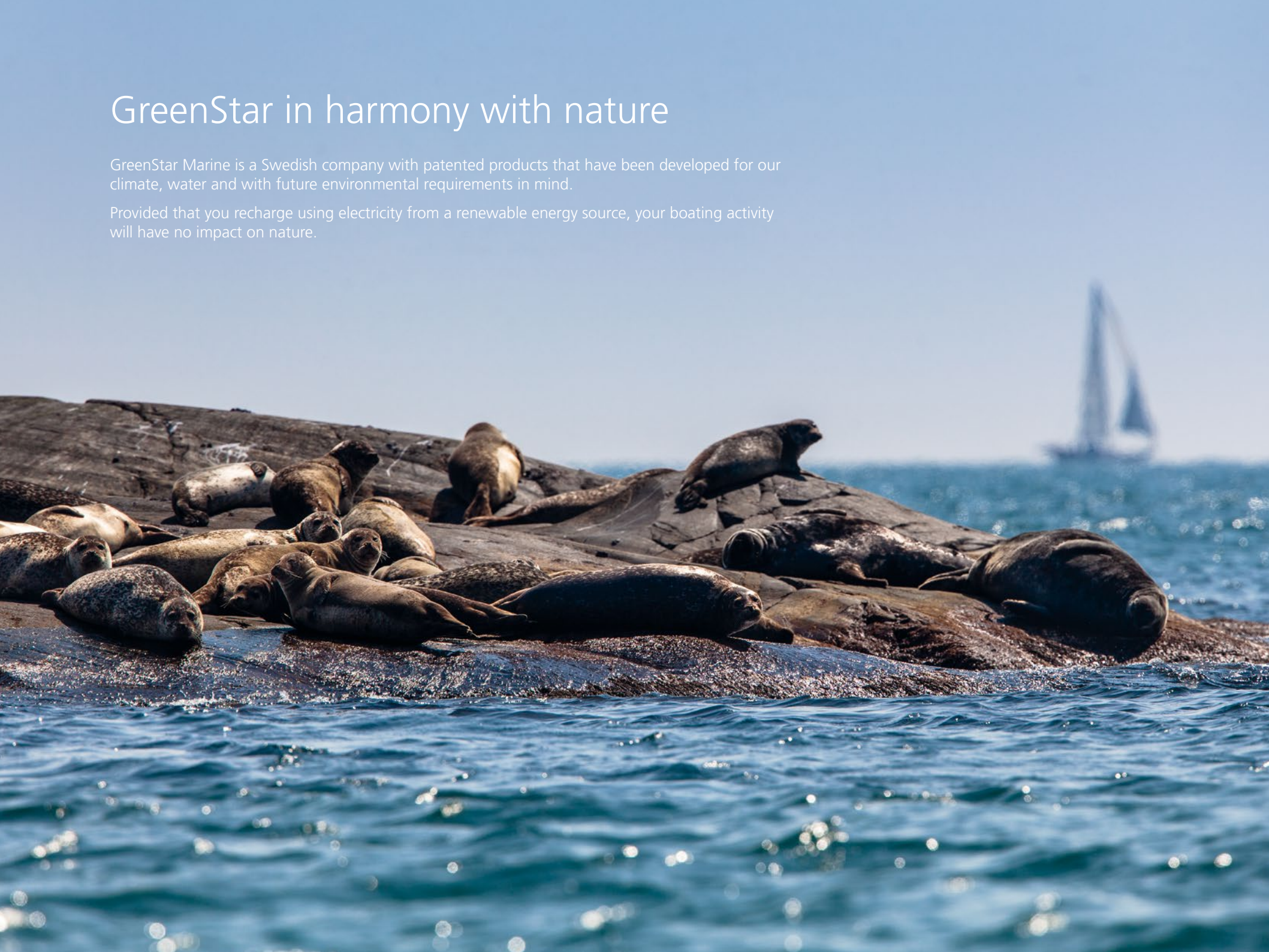
We are constantly developing

Our development team is working constantly to improve our products and to ensure that everything remains compatible with your GreenStar system.

GreenStar in harmony with nature

GreenStar Marine is a Swedish company with patented products that have been developed for our climate, water and with future environmental requirements in mind.

Provided that you recharge using electricity from a renewable energy source, your boating activity will have no impact on nature.



GreenStar marine

GreenStar Marine AB
Baggåkersgatan 4A
SE-431 53 Mölndal
Sweden
Tel.: +46 31 14 80 70
info@greenstarmarine.com
www.greenstarmarine.com