Fischer Panda®

2014 / 2015

Whisperprop Hybrid Drive Systems

Whisperprop - the next generation

The new Whisperprop Drive Systems are designed for boat owners wanting to experience electric cruising. Fully 100 % battery, parallel hybrid and generator supported systems are available whether you just want to cruise, support your ship's diesel or power a complete electrical system.

... quiet, comfortable with hours and hours of energy.

The systems are battery based so that a wide range of performances can be covered. A battery bank with sufficient capacity is used to power the electrical drives, system, air conditioning and other domestic electrical appliances. Fischer Panda diesel generators supply energy to the battery bank keeping it charged. Manoeuvring difficulties (especially in the lower speed range) are solved using dynamic permanent magnet motors with very high thrust. The batteries can also be recharged when sailing by dragging the propeller. The Fischer Panda drive systems are available with 48 V or 288 V depending on the power requirements.

12 good reasons for Whisperprop

Enjoyment
- Silent drive
- Electric power in abundance
- Unique manoeuvrability

Future
- Tomorrow's technology available now
- New design possibilities
- Professional 24 h support / Safety

Environmentally friendly
- Extremely low running costs
- Up to 100 % emission-free
- Efficient motor (efficiency up to 96 %)

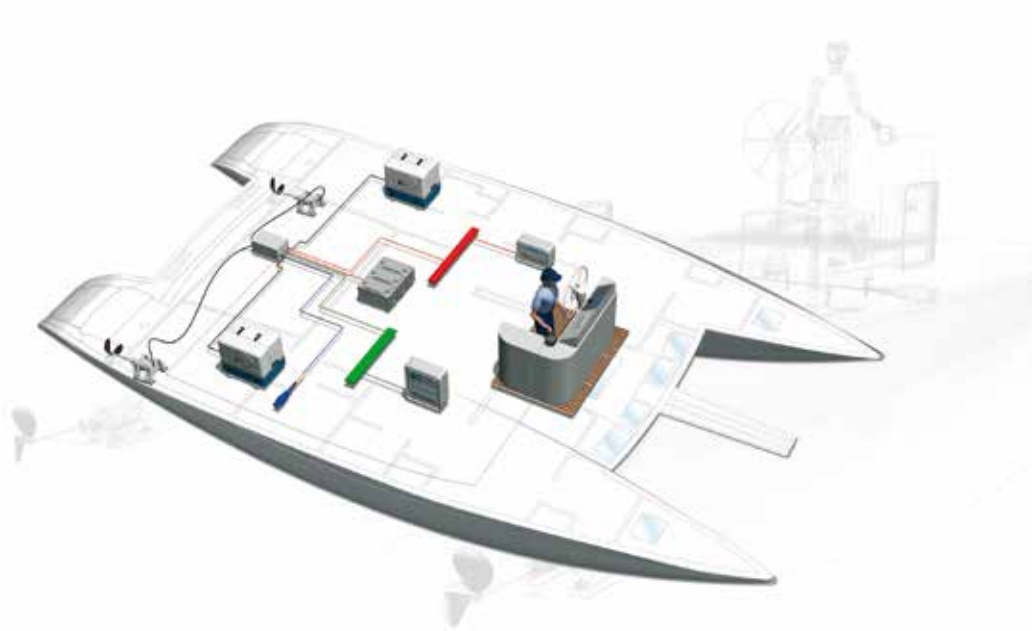
Intelligent
- Complete - one system from one source
- Full automation possible
- Control from smartphone or tablet possible


Angel of Silence
Primeur

SOLAGUEN

Trendsetting and environmentally friendly

A **trendsetting** and environmentally friendly system. Emission-free power is available.



Comparison: Conventional Drive Technology vs. Hybrid Drive System

Conventional Drive Systems

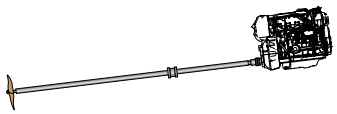
A conventional drive system consists of a diesel engine, a transmission and a propeller. The components are coupled together via a shaft. The diesel engine is mechanically controlled by the throttle.
A major disadvantage of the conventional drive system is that the transmission is heavily used which causes early wear.
Additionally, a large amount of space is required for the shaft which connects the diesel engine and the gearbox (transmission) to the propeller. If the shaft rotates throughout the boat's length, it may also result in increased noise levels.

Hybrid Drive System

In a Whisperprop Hybrid Drive System (HDS), the "cable replaces shaft" concept requires far less space. Energy is stored in a battery bank and supplied via cable to an electric motor. A synchronous (permanent magnet) electric motor is mechanically coupled directly to the ship's propeller. These modern, dynamic permanent-magnet motors have very high thrust even in the lower speed range. Battery-only operation, already required on many inland waterways and lakes, is now possible.
An efficient Fischer Panda diesel generator can also be installed into the system. This is only required to run when the batteries need charging or a higher amount of continuous power is required. The battery also ensures that operation is still possible if the generator fails so power for manoeuvring is available at all times.
The system also supplies the entire electrical system with energy. Fischer Panda generators have a very low sound level and operating noise on board is barely audible.

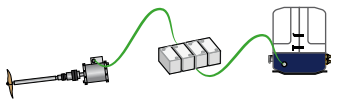
Disadvantages of conventional drive systems:

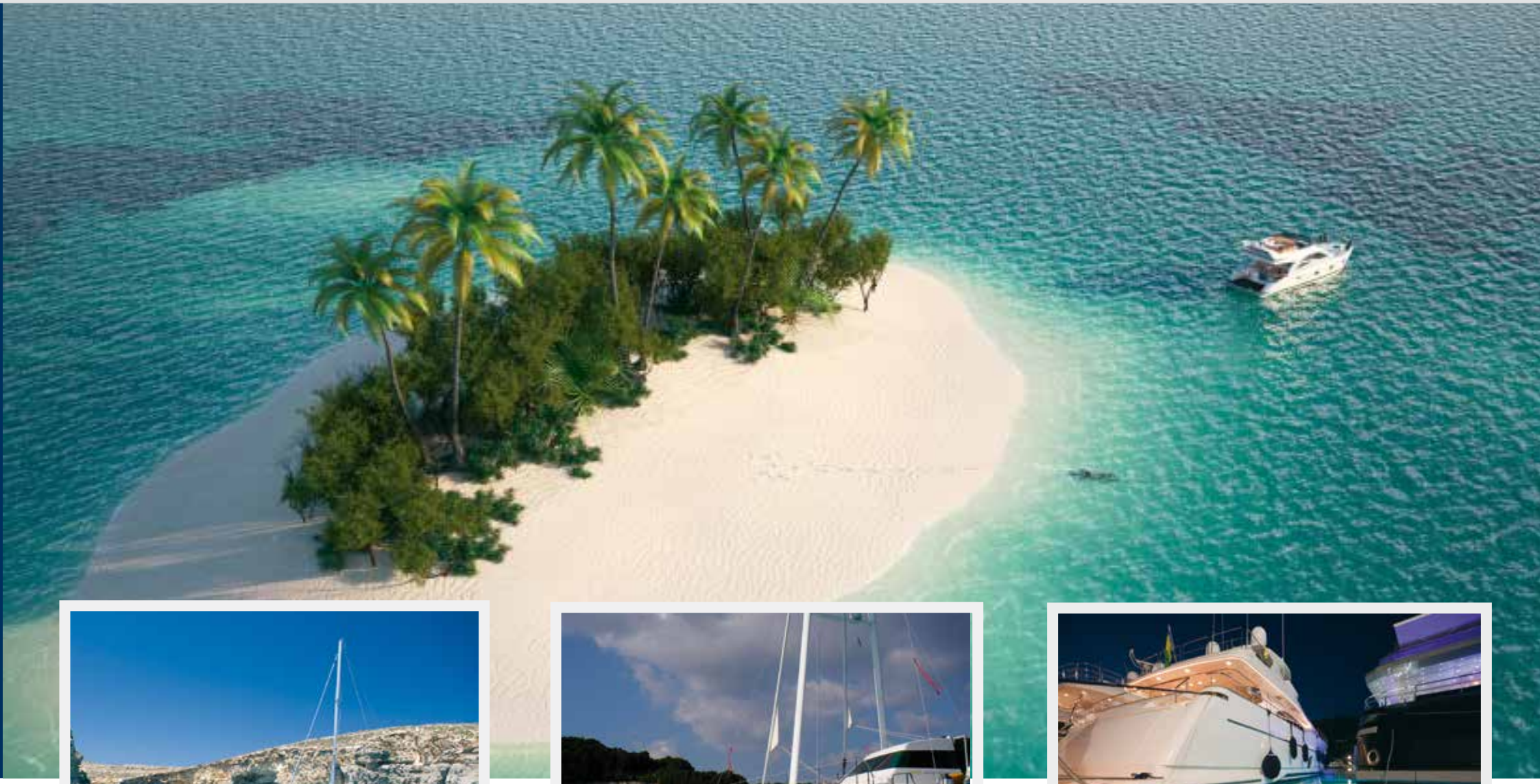
- Large space requirements
- A lot of wear
- High noise levels



Advantages of Hybrid Drive System:

- Space-saving
- Low fuel costs
- Low maintenance costs
- On board power supply included
- Very quiet operation
- Good manoeuvrability even in the low speed range





NumberOne

Completely new cruising experience...

Advantage 1

Greater peace through silent cruising

Treat yourself to the peace and quiet you deserve. The main advantage of the Fischer Panda diesel-electric drive is that the drive is nearly silent when operating with the battery. There is nothing better than cruising silently. The one question you will ask yourself again and again, ‘is the motor running?’ Noises are minimal even when the generator is switched on.

Enjoy the natural environment without disturbance

Sound levels of a 30 kW drive noise in decibels

Pure electric cruising	52 dB
Cruising with generator	64 dB
Diesel engine	72 dB

When cruising with the batteries only, the noise level due to the drive shaft is about 52 dB. Even when the generator is running, noise levels of about 64 dB are still very low because of the Fischer Panda generator’s sound shield. This dramatically improves comfort on board. People can perceive changes to sound levels by 1 dB under certain conditions. A 10 dB change equates to a doubling or halving of the perceived sound level.

Advantage 2

Abundant power on board

…using powerful generators and suitable batteries

Power on board is a true luxury – and this is available in ample quantities at all times. Do you want to use (ideally all at the same time) your laptop, TV, air conditioning, coffee machine, refrigerator, freezer and the oven? With a diesel-electric drive system from Fischer Panda this is not a problem. “Power in abundance” is available using powerful generators and a suitable battery bank. An inverter supplies all the domestic electrical consumers with 230 volts AC, pure sine wave of course.

Power supply just like you would expect at home.

Future...

- Advantage 3

Unique manoeuvrability

Manoeuvring can be a strenuous undertaking, especially when in the harbour or marina. The Hybrid Drive System brings real relief making it as easy as child's play. The Fischer Panda electric motor provides maximum torque throughout the speed range. Exact manoeuvring with the accuracy of a centimetre is possible even in low speed ranges.

Manoeuvring accurate to the centimetre... even at low speeds.

- Advantage 4

Tomorrow's technology available now

Climate change is currently one of the biggest issues facing us. Whether it is caused by people or naturally, an urgent re-think in the field of drive systems is required.

The electric drive is an emission-free and clean alternative to the internal combustion engine! Even though low battery capacity limits 'battery only' cruising at high speeds to a very short distance, the range increases overproportionately when cruising at lower speeds. By combining both, Fischer Panda offers a competitive alternative to the conventional combustion engine. Lower speeds are supplied by the battery and the additional performance required at high speeds can be supplied by a generator. Range problems are now a thing of the past.

Better for the environment...

...using an electric motor instead of a combustion engine

- 0 % Emissions
- 100 % Power

Increased Range...

...from sufficient energy.

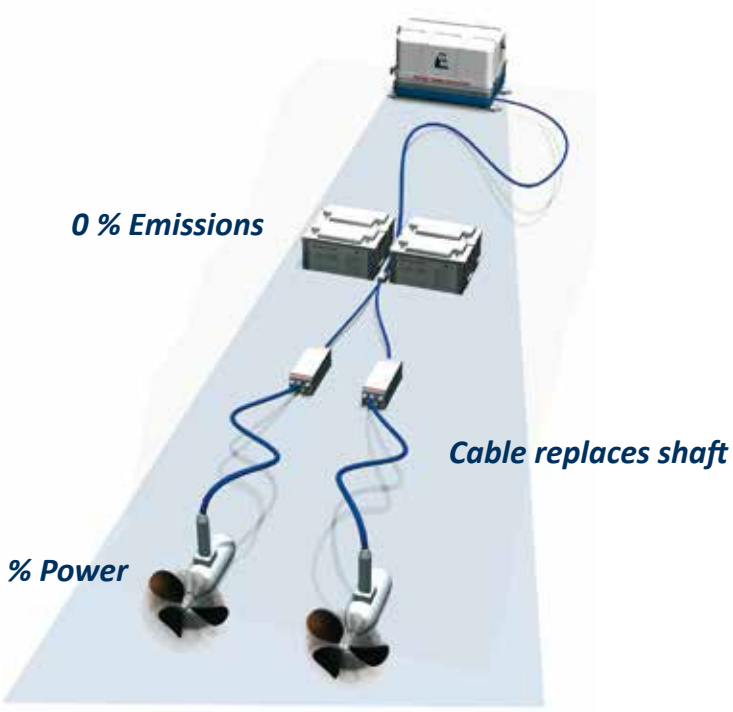
Plenty of room...

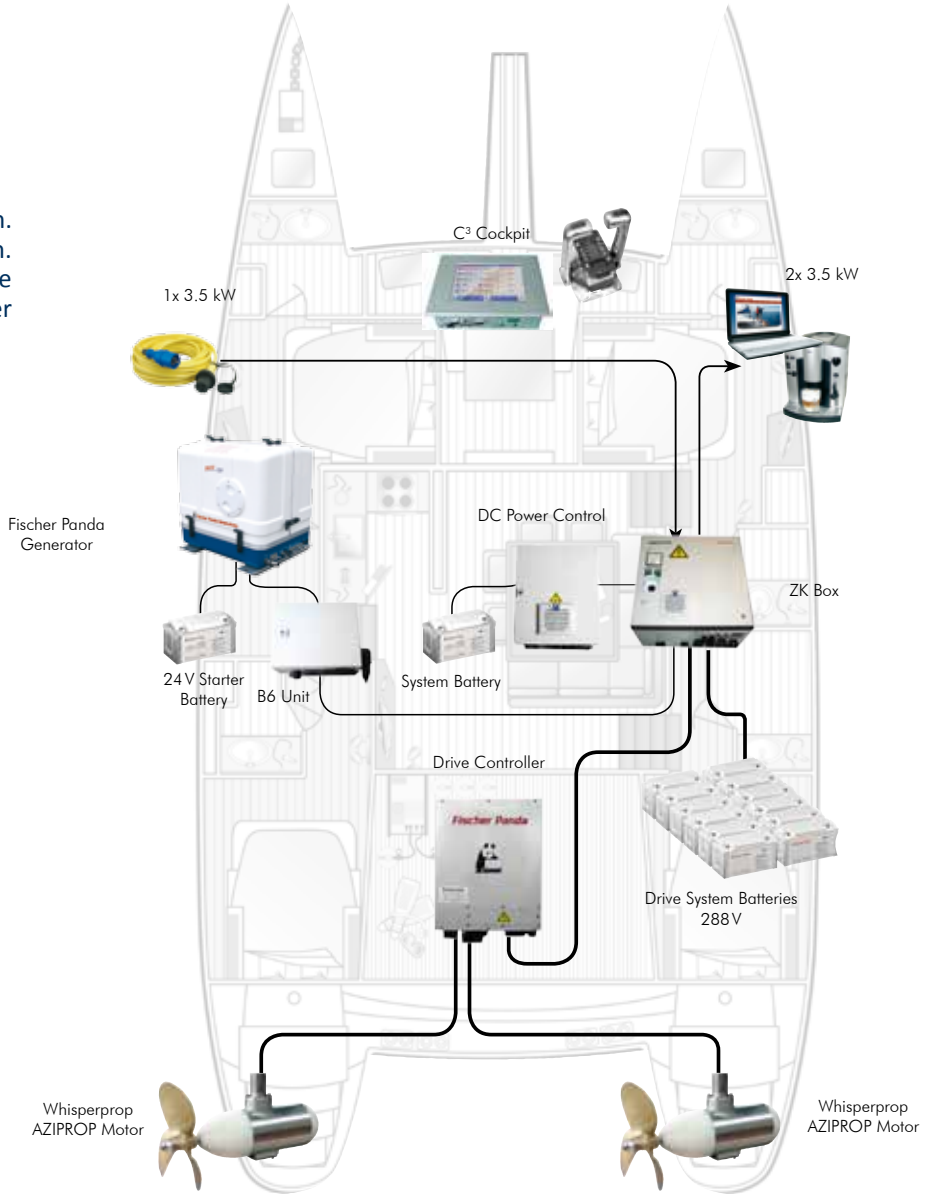
Advantage 5

Individual use of the available space

It is now possible to create completely new interior concepts when installing a Fischer Panda Hybrid Drive System. The position of both engine and shaft are already defined when constructing a vessel with a conventional system. The hybrid system is far more flexible - mechanical components are connected using flexible electrical cables. The system can be distributed throughout the whole boat - wherever space is available. This gives you a far greater range of layout variations.

Completely new design concepts can be realised with the idea "cable replaces shaft".





Safety...

Advantage 6

24-hour professional support

A major strength in this system lies in its redundant design where great emphasis is placed on safety. Even in the event of generator failure, it is still possible to use the battery bank as a source of energy and take the boat with its passengers into the harbour. A 24/7 hotline is also available worldwide in the event of a major problem. Remote diagnosis of any problems using an internet connection provides a means of direct assistance.

Help, day and night, if there are unexpected problems

Tel.-No. +49 5254 9202-767 (SOS on a keyoperated telephone)

Low cost cruising...

Advantage 7

Extremely low cruising costs

One litre of diesel supplies energy of approx. three kilowatt hours (kWh). It is possible to refuel at the harbour at a reduced cost or even free of charge with a Hybrid Drive System. It pays off in the long term.

...great fuel savings possible

Cruise anywhere...

Advantage 8

Up to 100 % emission free

The world is turning green – be part of it!

On many inland waterways and lakes across Europe and beyond, the use of a combustion engine is now prohibited. These restrictions do not apply to the Fischer Panda Hybrid Drive System and you can cruise without concern. We guarantee that you will be envied for this freedom!

The system is also designed so that it can be upgraded to include solar and wind energy.

....even where combustion engines are prohibited!

Advantage 9

Efficient motor (96 % efficiency!)

A distinctive feature of the diesel-electric drive system is that the electric motor operates with a very high efficiency up to 96 %. Conventional petrol or diesel engines which generally have just 40% are considered to be extremely efficient.

The most efficient way to travel...

If you do not have the opportunity to recharge your batteries from a shore power connection, you can simply use your generator to supply the energy. As the generator always runs within an optimal speed range, it is considered to be significantly more efficient than a conventional diesel. Even with a generator installed, the Hybrid Drive System from Fischer Panda can save up to 20 % fuel per hour.

...get more from your stored energy.

Everything from one source...

Advantage 10

Complete - a single system from one source

Fischer Panda provides you with the complete hybrid system from one source! All the components are exactly matched to each other, including the electric motor, the battery bank and generator and all the additional electronic parts that make up the complete system. This ensures that you have a complete system you can rely on.

A further advantage for you is having Fischer Panda as a reliable partner at your side. We take care of repairs, warranty issues or any unexpected problems. Through an extensive network in eighty countries, Fischer Panda can provide expert help to customers almost anywhere in the world.

...exclusively from Fischer Panda

Whisperprop Hybrid Drive System - frequently asked questions

Is it worth it for me?

- Initial investment is covered over the long term.

The Hybrid Drive System (HDS) is a system that is not only responsible for the drive system but also for the complete supply of energy on board so it has to ensure a continuous power supply. When comparing the Hybrid Drive System with a conventional drive and including an additional power system with generator + control, the HDS is even more favourable in the long term just from the fuel savings and the low shore power costs.

- Low maintenance costs

The diesel generator in a hybrid drive system is used far less than the engine in a diesel-only setup. Maintenance costs are reduced further because an electric motor is virtually maintenance free.

Will the system fit in my boat?

- Individual room solutions

Space on board is very limited. The advantage of the Hybrid Drive System is that it consists of components that can be installed wherever space is available. The space of the boat can be utilised optimally. It is possible to install the generator even in the boat's centre. This offers a wide range of installation variations.

Do I get support?

- Professional advice and after- sales service

Of course we will assist you right from the planning stage. Our competent team of professionals is available to consult and offer you advice. We also support you afterwards with a full after-sales service.

- SOS-24/7 Hotline

We provide a 24/7 contact service in the event of generator problems or urgent requests of any kind
(Tel. No. +49 5254 9202-767- SOS on a key-operated telephone).

- Worldwide Service and Sales Network

With a coordinated network of distributors, dealers and service stations Fischer Panda has trained specialists world-wide. They will provide you with advice and support and recommend you the best service stations, depending on the location of your vessel. They can help you with the organisation and coordination of resources and spares, so you get the best service- wherever you are.

The "Global Service Directory" can be downloaded from the company website.

Fischer Panda - your partner

Fischer Panda generators will supply you with reliable power at any time

- 3 kW to 200 kW generator systems
- Worldwide Partner in your area
- Very quiet operation and low vibration

- Extremely silent and light generators
- Parallel operation with multiple generators
- Integration with the main control system of the ship

Owners set their expectations very high when it comes to the on-board power supply. Components must not take up too much space, be light as possible and quiet. The power supply has to be just as reliable as it is at home and fool-proof to operate.

More than thirty years ago, Fischer Panda developed a generator technology that could meet these high demands.

Since then, numerous ship-owners in the world have appreciated both this and the quality of the technology used in the Fischer Panda generator. Years of experience with continuous research and development work have resulted in many developments, refinements and even award-winning innovations.

Today, Fischer Panda has an extensive range of standard products and also offers custom solutions for an individual energy supply that is tailored precisely to the customer.

Global dealers and partners

Numerous dealers and partners worldwide are available to advise and support you.

Image Courtesy: www.elektrischvaren.info

System overview

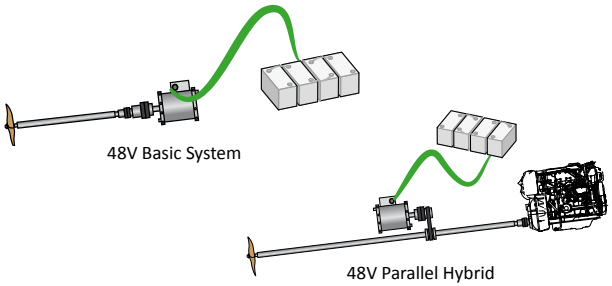
48 V Basic System

- 100 % electric
- up to 20 kW
- new: 40 kW (2 x 20 kW)

The 48 V Basic System provides your boat with a basic electric drive system. The system is quick to install (plug and play) and all electrical components are contained in one unit.

It is primarily designed as a battery only system with a 48 V battery bank of sufficient capacity. The batteries can be charged via shore power connection or at the touch of a button using the re-generation 'REGEN' function (when main engine is running or using propeller drag when sailing)

- Entry level electric drive system
- 'Plug and play' connectors and LCD panel
- Charging via shore power / charger or using REGEN function

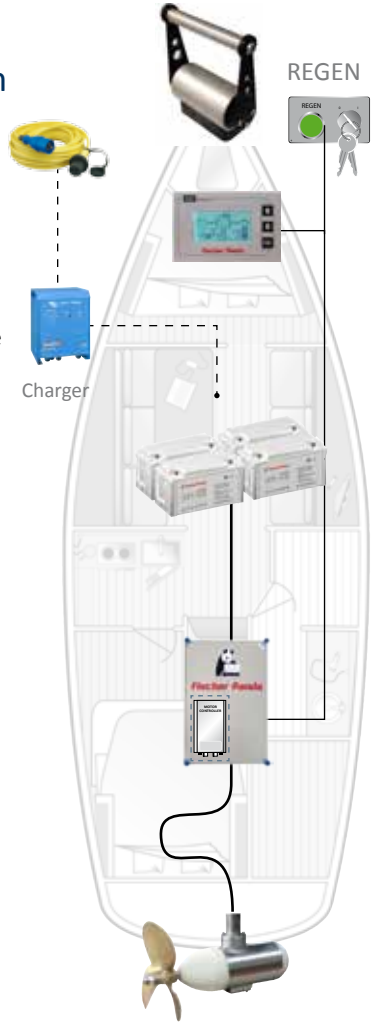


48 V Basic System

Perfect for cruising on waters where combustion engines are not allowed. The system is designed for monohulls, catamarans or trimarans requiring a single or dual drive system.

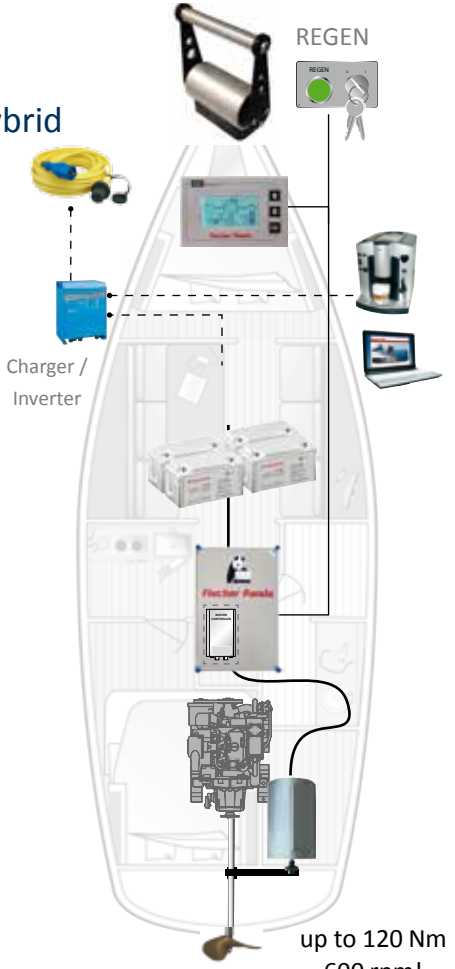
- 1 x 10 kW / 2 x 10 kW DE-Shaft or AZIPROP podded drive
- 1 x 48 V battery bank

Extremely quiet battery operation



48 V Parallel-Hybrid

This system is ideal for cruising or manoeuvring (especially at low speeds) when a traditional ship's main engine is installed. The drive engine is mounted parallel to the existing shaft. No modification to the shaft or engine is required. By simply pressing the REGEN button, the battery bank can be recharged when the main engine is running.
This system is for ships with a traditional combustion engine/gear.



- 1 x 10 kW or 2 x 10 kW (with two main engines)
- Parallel Hybrid Drive
- 48 V Battery Bank
- Options for powering domestic electrical consumers

48 V Premium HDS

- 100 % electric
- up to 20 kW
- plus Generator

The 48 V Premium HDS (Hybrid Drive System) provides a complete on-board power system up to 20 kW. The C³ touchscreen panel provides a central point for system monitoring and control. Various modules are available allowing the vessel's components and electrical consumers to be integrated into the system as required.

This system provides quiet cruising using the battery. It can be expanded to integrate a Fischer Panda Motion Generator. This allows extended cruising and battery charging without shore power. Options for powering domestic electrical consumers are also available.

- Complete System with centralised control
- C³ touch panel with bus system
- Options for powering domestic electrical consumers

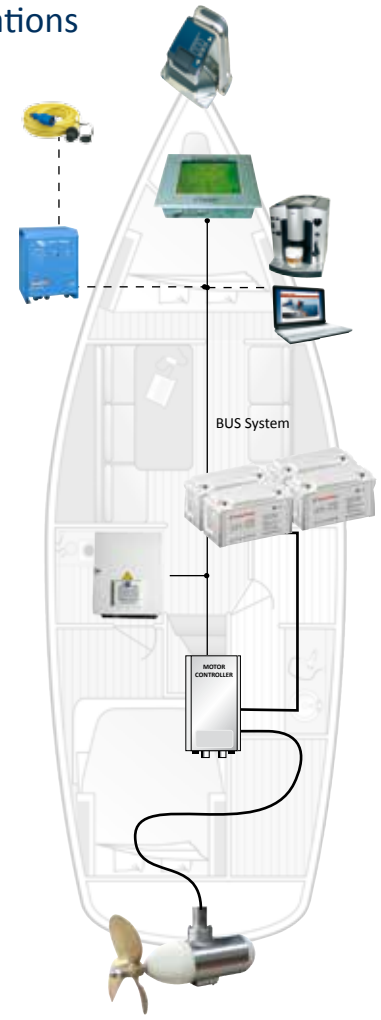
Battery only installations

Perfect for cruising on waters where combustion engines are banned.

48V HDS Drive System: Single drive system for boats requiring one or two drives.

- 1 x 10 kW / 2 x 10 kW DE-Shaft or AZIPROP podded drive
- 1 x 48 V battery bank

Extremely quiet battery operation



Generator support for extended cruising

Upgrades the 48 V Hybrid Drive System with one or more Fischer Panda Motion generators. This provides for extended cruising, a higher speed and powerful battery charging capabilities without shore power.

- Generators for charging and continuous cruising.
- One generator can charge power drives
- Safety through redundancy (backup)

Image Courtesy: www.elektrischvaren.info

288 V Premium HDS

- 100 % electric
- up to 100 kW
- plus Generator

The 288 V Hybrid Drive System is suited for large and complex systems for drives up to 100 kW. The C³ touchscreen panel provides a central point for complete system monitoring and control. Various modules are available allowing the vessel's components and electrical consumers to be integrated into the system as required.

The basic system provides quiet cruising using the battery. It can be expanded to integrate a Fischer Panda Motion Generator if extended cruising or battery charging without shore power is required. The system has a fully integrated 3.5 kW shore power connection and 2 x 3.5 kW for the on-board domestic electrical consumers. The system can be increased if more power is required.

- Complete system with centralised control
- C³ touch panel with bus system
- Power for on-board electrical consumers
- Integrated shore power with battery charging

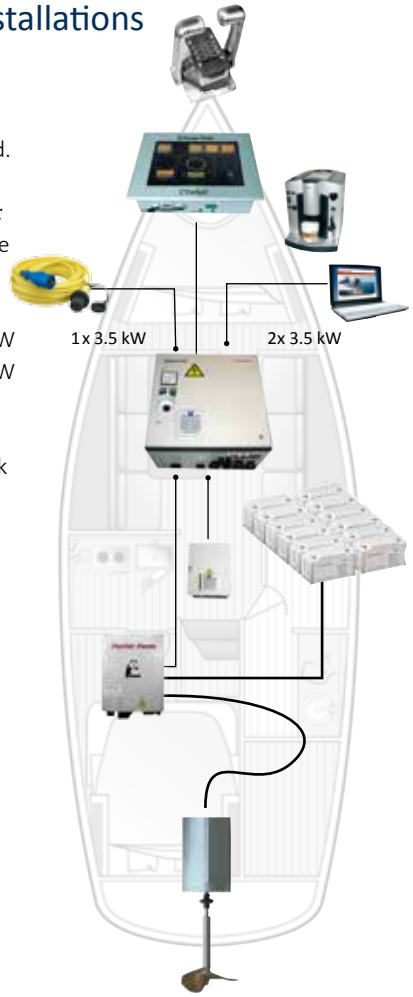
Battery only installations

Perfect for cruising on waters where combustion engines are banned.

288V HDS Drive System: Single drive or dual drive systems

- 1 x 30 kW / 1 x 50 kW
  2 x 30 kW / 2 x 50 kW
- DE-Shaft or AZIPROP podded drive
- 1 x 288 V Battery Bank

Extremely quiet battery operation



Generator support for extended cruising

Upgrade the 288 V Hybrid Drive System with one or more Fischer Panda Motion generators.
This provides for extended cruising at high speed and powerful battery charging capabilities without shore power.

- Generators for charging / continuous cruising.
- One generator can charge power drives
- Safety through redundancy (backup)

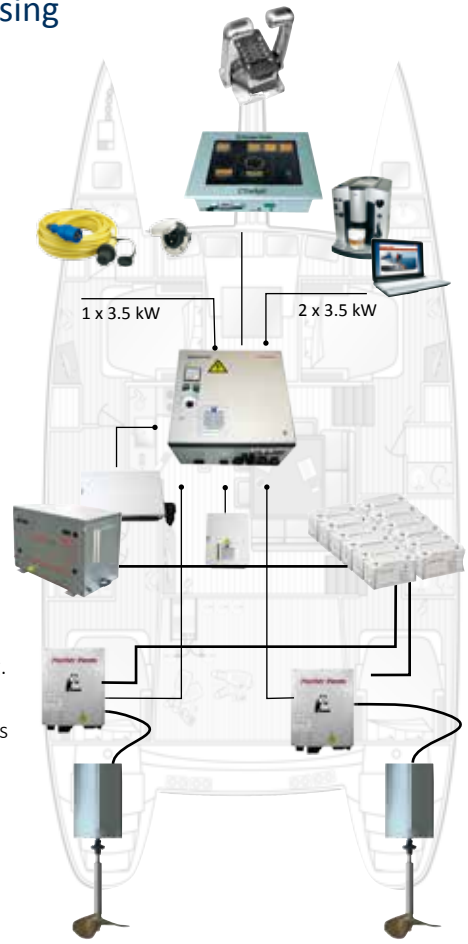


Image: Christian Schneinder

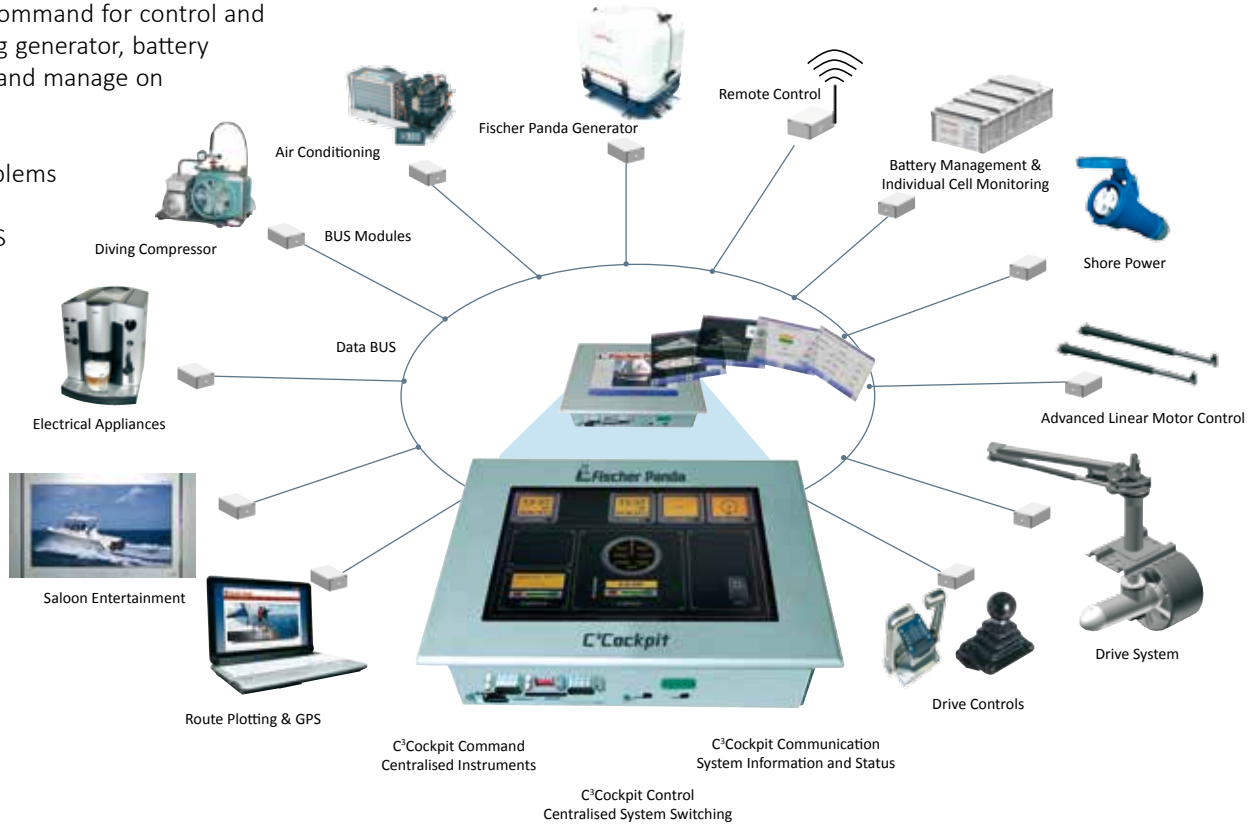
C³-Cockpit - control everything from one place

"Command, Control and Communication" (C³) are the key elements behind the new C³-Cockpit. All BUS-system components are connected together and can communicate with each other. The status and current parameters of all BUS connected components such as the drive system, throttle, generator and batteries are displayed. The skipper has a complete overview and can modify parameters and operate devices.

With optional BUS modules it is possible to expand the system and use many new possibilities and functions available into your electric drive. All Fischer Panda BUS modules are connected together via the C³-Cockpit which serves as the system's central control unit. This allows all information and control functions to be displayed on the C³-Cockpit and operated via the touchscreen. The C³-Cockpit becomes the yacht's central command for control and monitoring of engine, cooling systems and the electrical distribution including generator, battery and consumers. This provides the skipper with everything needed to control and manage on board power requirements from a single control point.

Precise battery management monitors individual batteries and warns of problems (even in single cells) thus protecting the battery bank against damage. Temperature and tank levels (fuel, water) can be monitored. An optional GPS module can be connected to obtain position, ship's speed and time.

Operating information of all components and control options can also be remotely accessed via a WLAN connection from your PC, tablet or smart phone. It is also possible to reconfigure the C³ Cockpit screen, so that all the information which you require to safely run your yacht is displayed. All components of the Fischer Panda Drive System are optimally matched and perfectly suited to combine the drive and energy supply.



C³Cockpit Color 10,4“

C³Cockpit Color 6,4“

C³Cockpit Monochrome 5,4“

Select and configure your individual system

Your personal drive system in 5 steps

C³Cockpit Color 10,4"

C³Cockpit Color 6,4"

C³Cockpit Monochrome 5,4"

Further information is contained in the "System Configurations" brochure

1

Drive System Package

Select a single or dual drive setup with either shaft (DE-Shaft), AZIPROP podded or Parallel-Hybrid motors.

2

Generator

Fischer Panda Motion Generators are especially for extended cruising and charging, e.g. when shore power is not available.

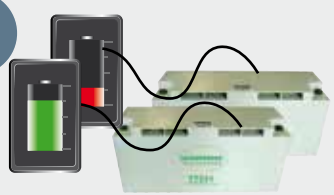
3

Cooling System

Standard cooling systems for Whisperprop drive systems. Single circuit, keel cooling and dual circuit cooling.

C³-Cockpit with BUS system

4



Battery Monitoring

Enhanced battery monitoring via BUS system. Monitoring individual battery cells within single or multiple banks is possible.

5

Second Control Position

Additional components for installing a second throttle on another control, i.e. flybridge.

		Drive System	Generator	Cooling System	C³ Cockpit with BUS system	
					Battery Monitoring	2nd Control Stand
48V Basic System	1 x 10 kW	✓		✓		
	2 x 10 kW					
48V Parallel-Hybrid	1 x 10 kW	✓		✓		
	2 x 10 kW					
48V Premium HDS	1 x 10 kW	✓	✓	✓	✓	✓
	2 x 10 kW					
288V Premium HDS	1 x 30 / 50 kW	✓	✓	✓	✓	✓
	2 x 30 / 50 kW					


NumberOne
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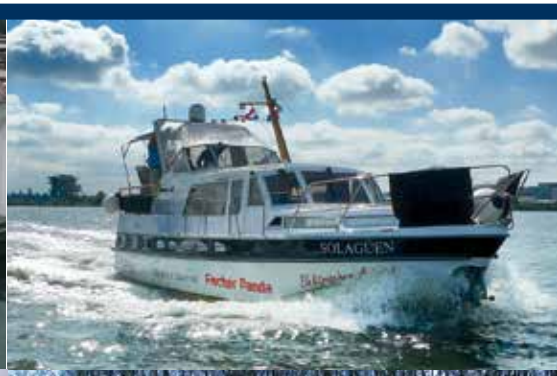
-30018

NumberOne







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