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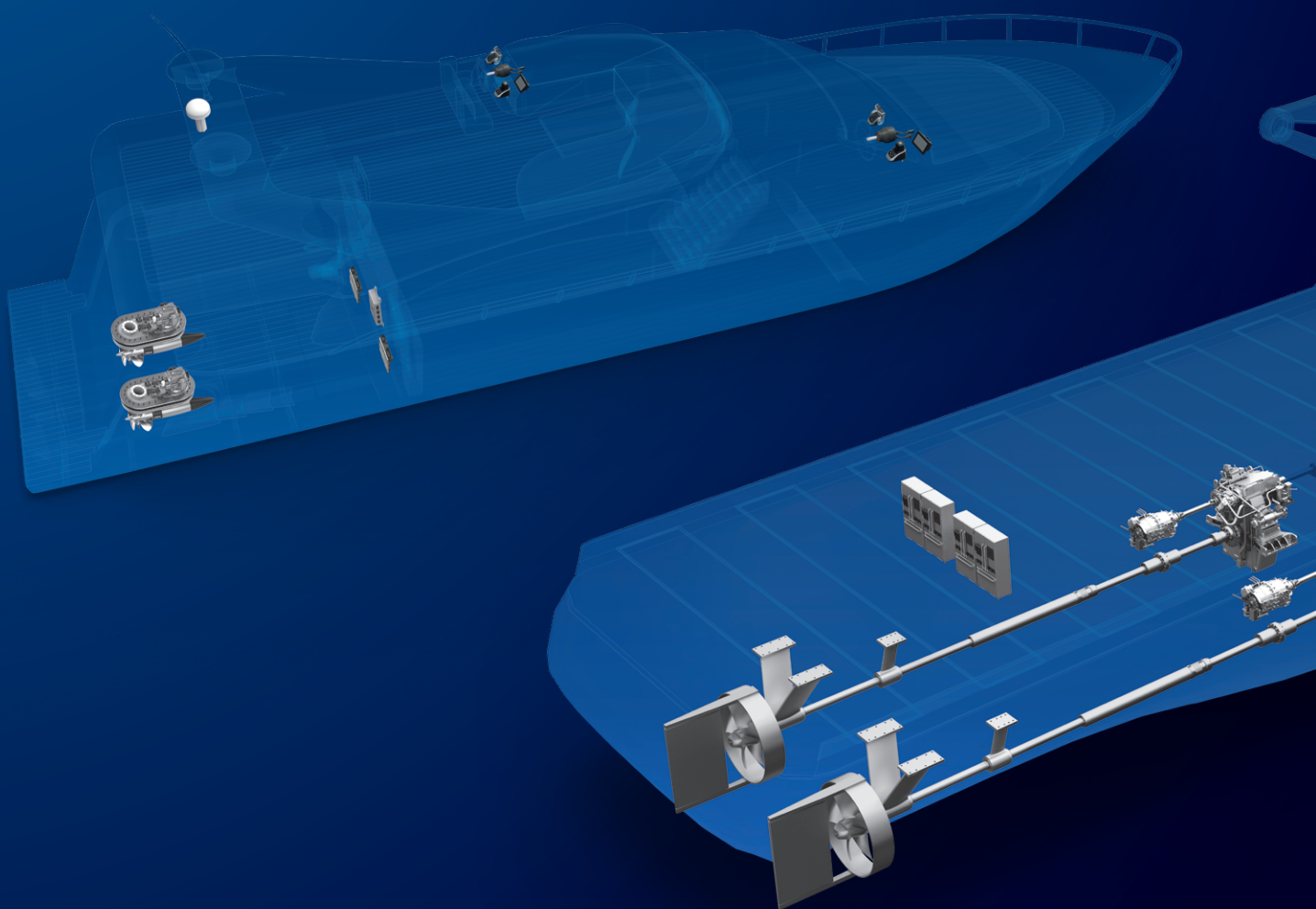
Together in Every Water

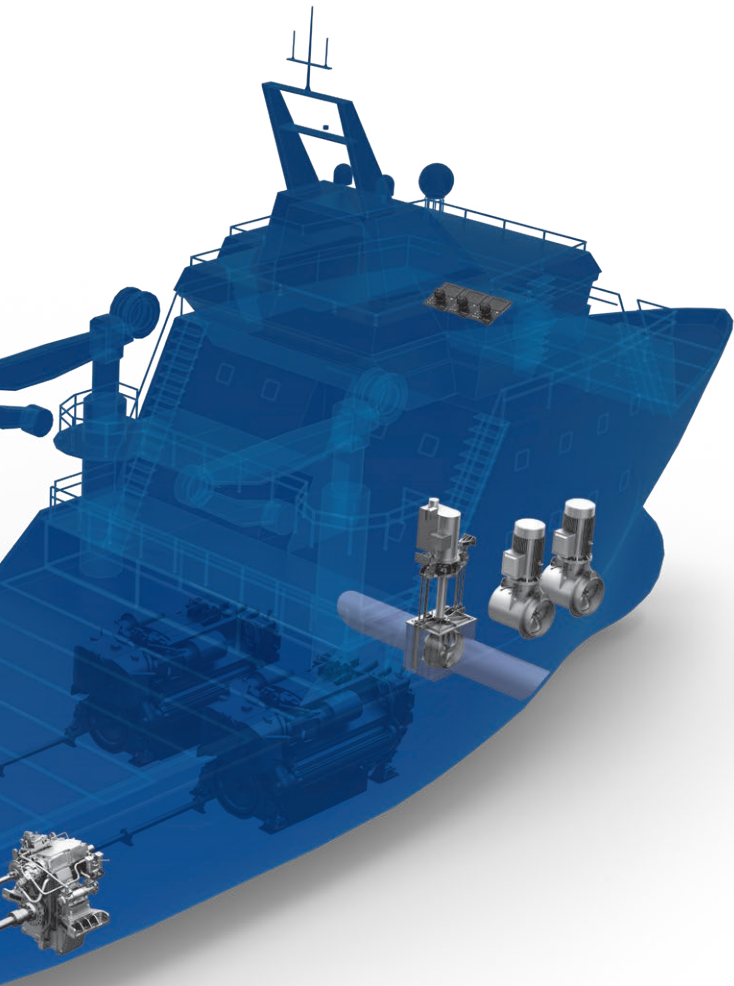
Marine propulsion systems



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Being Your Trusted Partner

ZF is a global technology company supplying advanced mobility products and systems for passenger cars, commercial vehicles and industrial technology. The company has a global workforce of 153,000 with approximately 162 locations in 29 countries.

ZF Marine is a global leader in propulsion solutions for commercial, leisure and governmental vessels, covering a power range from 10 to 12,000 kilowatts. The portfolio spans hybrid, electric and conventional marine transmissions and thrusters as well as control systems engineered for demanding maritime environments and adaptable to individual vessel requirements. Building on decades of marine expertise, customer-specific system solutions, and global lifecycle support, ZF is a trusted long-term partner delivering performance, ease of operation, and peace of mind at sea.

ZF annually invests about 8.5% of its sales in research and development. Marine products benefit from ZF Group R&D investments e.g. through the design of light gearboxes with high torque transfer rate, worldwide unique acoustics test benches and continuous development of single parts.

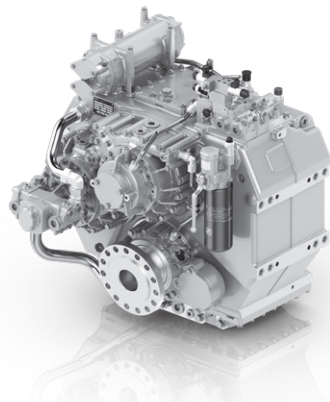
Excellent products are backed up by dedicated 24/7 service through the extensive worldwide network of ZF Marine.



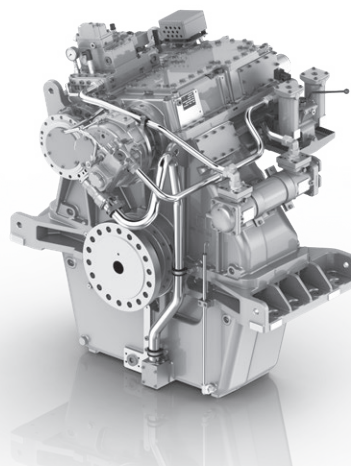
Transmissions for Commercial & Fast Craft Applications

ZF provides a complete line of compact, high-performance transmissions, specially configured to meet designers' requirements. Numerous ratios are available that perfectly match today's medium- and high-speed diesel engines as well as electric motors. Highest quality standards, intelligent design concepts and ease of maintenance ensure compliance with specified operating profiles at minimum downtime and lifecycle cost.

ZF 5000

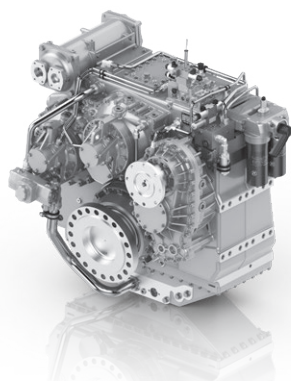
**Fast craft transmissions**

Large motor yachts, superyachts, offshore supply vessels, government vessels and fast ferries are typical applications for this series of marine transmissions. It is characterized by an optimum power-to-weight ratio, capable of withstanding high loads under extreme operating conditions.

**Commercial transmissions**

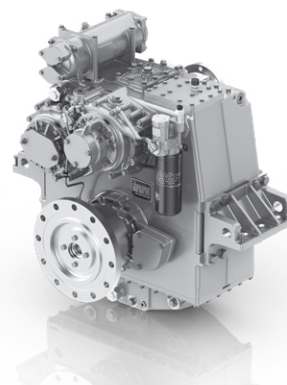
With its outstanding ToughGear series, ZF Marine provides a complete line of heavy-duty transmissions featuring robust cast iron housings built to ZF's industry-recognized "Class 1A" specification. Numerous ratios are available that perfectly match today's medium-speed diesel engines.

ZF 9200 A PTI

**Hybrid-ready transmissions**

For installation in medium and large vessels, ZF Marine has developed a series of hybrid-ready marine transmissions for commercial and fast craft applications. Variants of both the ToughGear series and fast craft transmissions feature optional Power Take-In (PTI) drives with various gear ratios.

ZF 3360 ENC

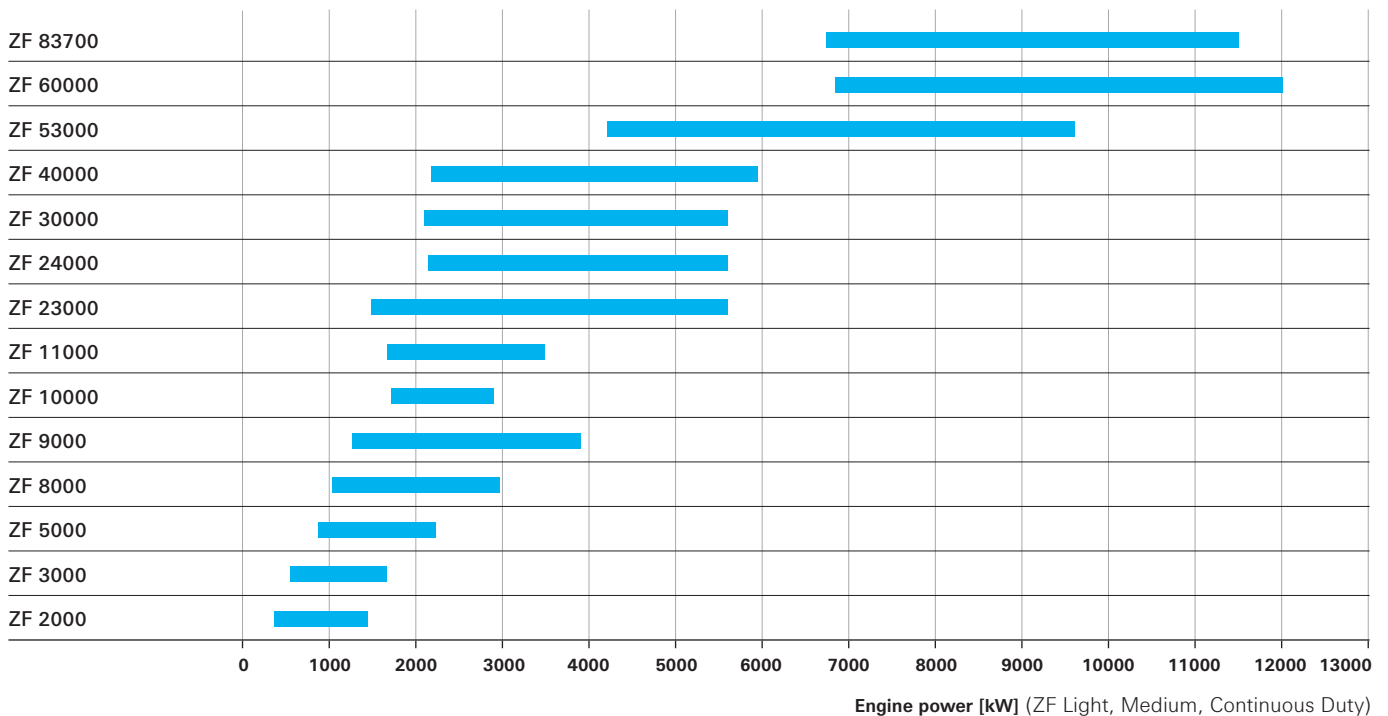
**ENC transmissions**

For all-electric vessels ZF Marine offers ENC (electric non-clutchable) transmissions that increase efficiency, comfort and overall system performance. By eliminating the need for a mechanical clutch, they feature a lightweight design with reduced oil volume for improved mechanical efficiency. The systems are designed for easy integration with ZF marine driveline solutions, supporting more efficient vessel operation.

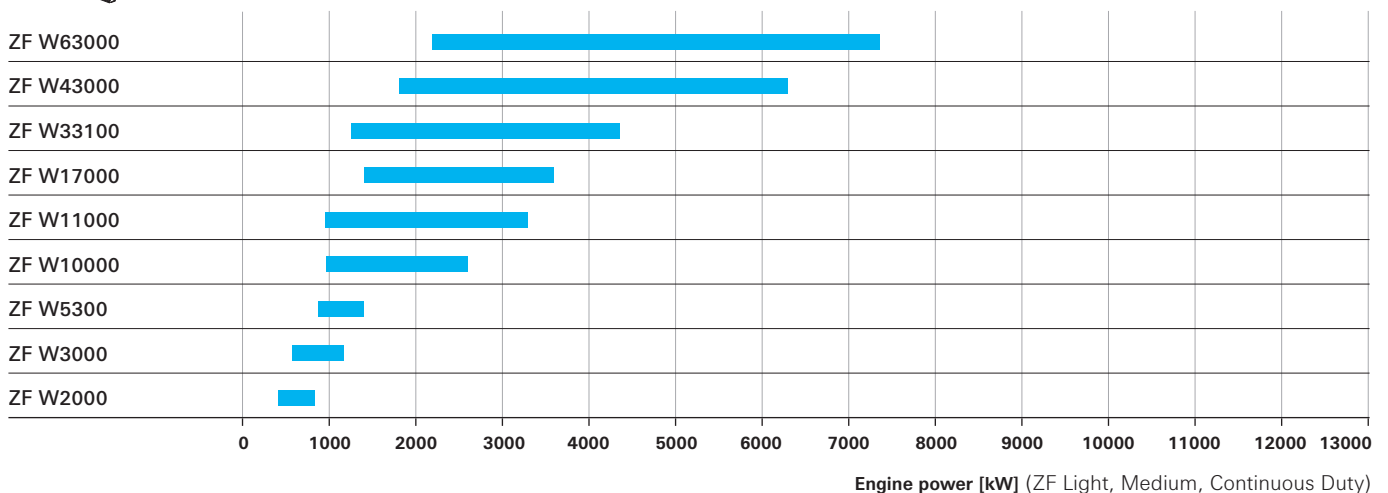
Transmissions for Commercial & Fast Craft Applications

Power range of ZF transmissions

Transmission series



TOUGH GEAR®



Transmission configurations

Transmission series	PTI option	PTO option	Shallow case 	Semi deep case 	Deep case 	A and V 	C 	D 	NR2H L/R 	NR2 	NR2B 
ZF 83700	•	•		•					• ¹		
ZF 60000		•	•						• ¹		
ZF 53000		•	•						• ¹		• ¹
ZF 40000	•	•	•	•				•	• ¹	• ¹	• ¹
ZF 30000	•	•	•	•				•	• ¹	• ¹	• ¹
ZF 24000	•	•	•	•			•	•	• ¹	• ¹	• ¹
ZF 23000		•	•				•	•			
ZF 11000	•	•			•						
ZF 10000	•	•			•						
ZF 9000	•	•	•	•		•			• ¹	• ¹	• ¹
ZF 8000	•	•	•	•		•		•	• ¹	• ¹	• ¹
ZF 5000	•	•	•	•		•		•	• ¹		
ZF 3000	•	•	•	•	•	•		•			
ZF 2000		•	•	•	•	•					

¹ Waterjet only / Abbreviations: PTI: power take-in, PTO: power take-out, PTH: power take home, A: down-angle, V: remote V-drive, C: coaxial, D: diagonal, NC: no clutch, NR: non-reversing, NR2: non-reversing/ two shafts (input above output), NR2B: non-reversing/two shafts (input below output), NR2H: non-reversing/two shafts (input horizontal output), EW: engine-wise, CEW: counter engine-wise

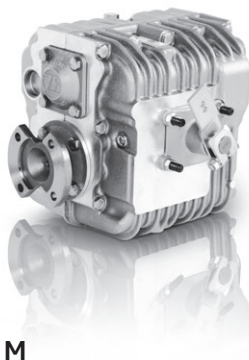
ToughGear transmission series	PTI option	PTO option	PTH option	Shallow case 	Semi deep case 	Deep case 	NR	NC	Shaft brake	AUTO-TROLL
ZF W63000		•		•			CEW			
ZF W43000	•	•	•	•	•		CEW	CEW		
ZF W33100		•			•		CEW	CEW		
ZF W17000		•		•	•	•	CEW/EW	CEW/EW	•	
ZF W11000	•	•		•	•	•	CEW/EW	CEW/EW	•	•
ZF W10000	•	•		•	•	•	CEW/EW	CEW/EW	•	•
ZF W5300	•	•			•		CEW/EW	CEW/EW	•	•
ZF W3000	•	•			•	•	CEW/EW	CEW/EW	•	•
ZF W2000		•			•	•	CEW/EW	CEW/EW		•

TOUGH GEAR®

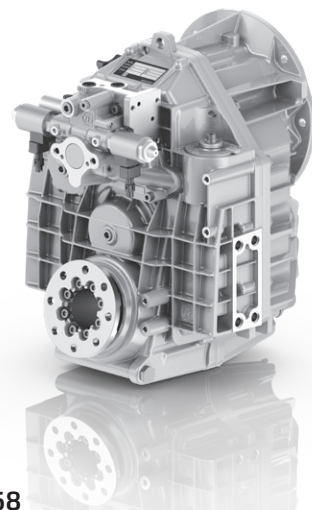


Transmissions for Pleasure Craft Applications

ZF offers a wide range of lightweight and robust transmissions suitable for all types of engines and propulsion systems, covering every application, such as motor yachts, cruisers, sport fishing vessels, watersports boats and sailboats, as well as patrol boats, fishing and small commercial vessels.



ZF 30 M



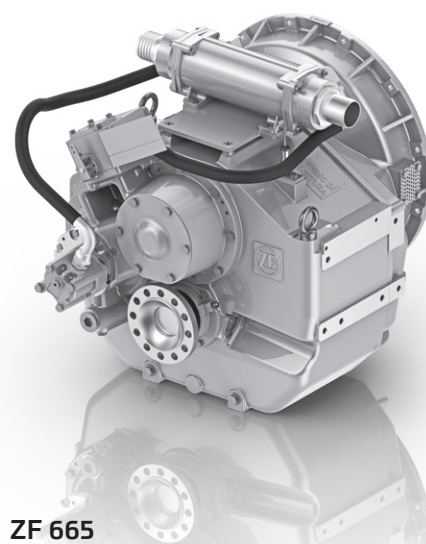
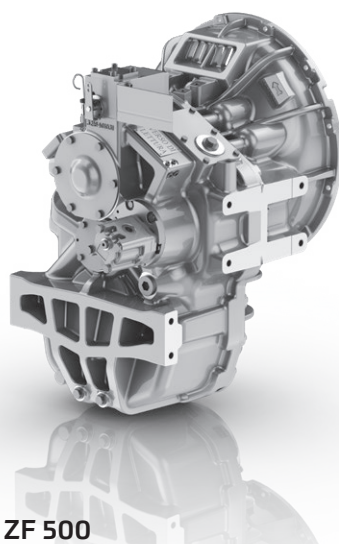
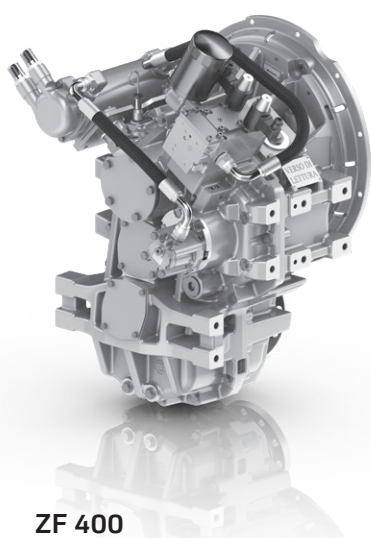
ZF 68

While the mechanically operated “M”-series transmissions are typically installed in lower horsepower applications such as sailboats and river craft, they are also utilized in life-saving applications such as lifeboats.

ZF transmissions for pleasure craft applications are designed for both forward and reverse reduction operation. The mid-range transmissions are primarily employed in various types of pleasure craft including watersports boats, sport fishing vessels, cruisers and luxury motor yachts. Transmissions with higher power ratings are equipped with ZF Marine’s innovative SuperShift2 clutch control.

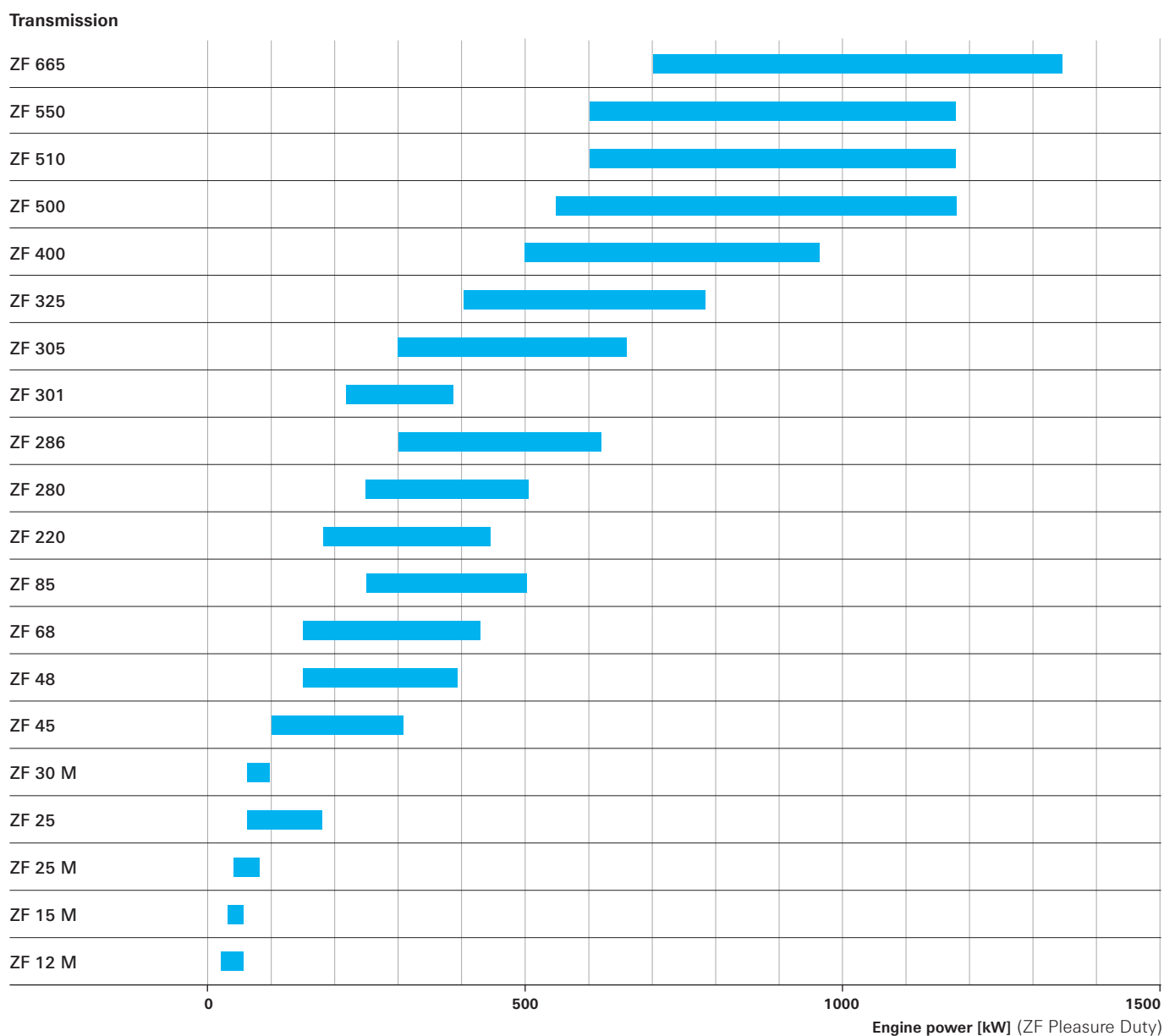
The transmissions are made of a robust yet lightweight seawater-resistant aluminum alloy housing. The output shaft thrust bearings of these transmissions are designed to take maximum propeller thrust astern and ahead. All the gears are calculated and optimized for minimum noise and maximum strength, case hardened with precisely ground gear teeth for long life and smooth running.

The transmissions are compatible with all types of engines and propulsion systems, including waterjets and surface-piercing propellers. They are built to withstand the duty cycles of not only pleasure craft but also commercial vessels. All of ZF Marine’s transmission design, manufacture and quality control standards meet ISO 9001.

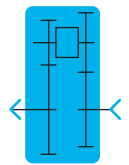
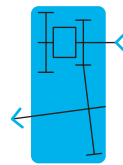
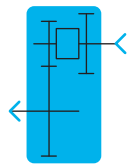


Transmissions for Pleasure Craft Applications

Power range of ZF transmissions



Transmission configurations



Transmission	Parallel offset	Down angle	V-drive	Coaxial
ZF 665	•	•	•	
ZF 550	•	•	•	
ZF 510		•	•	
ZF 500	•	•	•	
ZF 400	•	•	•	•
ZF 325	•	•	•	
ZF 305	•	•		
ZF 301		•		•
ZF 286	•	•	•	
ZF 280	•	•	•	
ZF 220	•	•		
ZF 85		•	•	
ZF 68	•	•	•	
ZF 48			•	
ZF 45	•	•		•
ZF 30 M	•			
ZF 25	•	•		
ZF 25 M	•	•		
ZF 15 M	•	•	•	
ZF 12 M	•			

Transmission Functionalities

In addition to their large variety and versatility, ZF Marine transmissions deliver another strong asset in terms of their outstanding functionalities.



Dynamic positioning capabilities

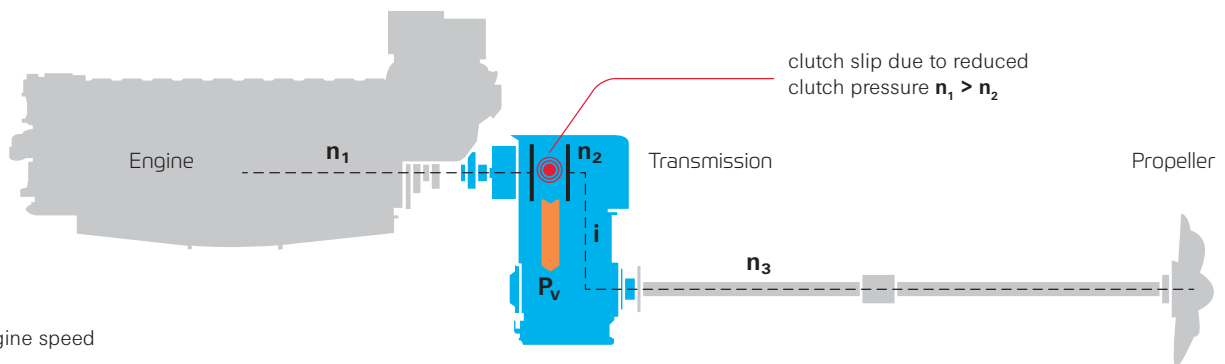
Transmissions from ZF Marine are designed to work in the most demanding applications. Our systems are designed for the tough duty cycles that workboats face. The SuperShift2 and AutoTroll features, combined with ZF controls enable the propulsion system to respond quickly and with the right amount of thrust to hold the vessel's position even in challenging weather conditions. For as long as the vessel needs to be on station, repeated gear engagements, reversals, and exact propeller speed are all available with no risk of damage to the propulsion system.

SUPERSHIFT2

ZF Marine SuperShift2 is a mechanical / hydraulic clutch control system operated by solenoid valves. The system incorporates standard components only and does not require electronic controls. This ensures the maximum possible durability and dependability. SuperShift2 is fitted to transmissions of ZF Marine propulsion systems as standard equipment at no extra cost.

SuperShift2 delivers

- Quick, smooth and practically undetectable shift engagement
- Precise and predictable control of transmission output, thus providing excellent low-speed vessel maneuverability
- Seamless interaction with ZF's Joystick Maneuvering System (JMS)
- Utilizes ZF Marine's proven reliable transmission technology
- Clutch pressure, modulated in two steps, allowing fast shifts without engine stall
- Shift quality is not affected in any emergency situations
- "Get home" capability incorporated in all models
- Satisfies all requirements of any classification standard
- Compatible with other control features such as Electric Trolling, AutoTroll and Dynamic Positioning



- n_1 = engine speed
 n_2 = speed on secondary side of transmission clutch
 n_3 = propeller speed
 P_v = heat loss
 i = transmission ratio

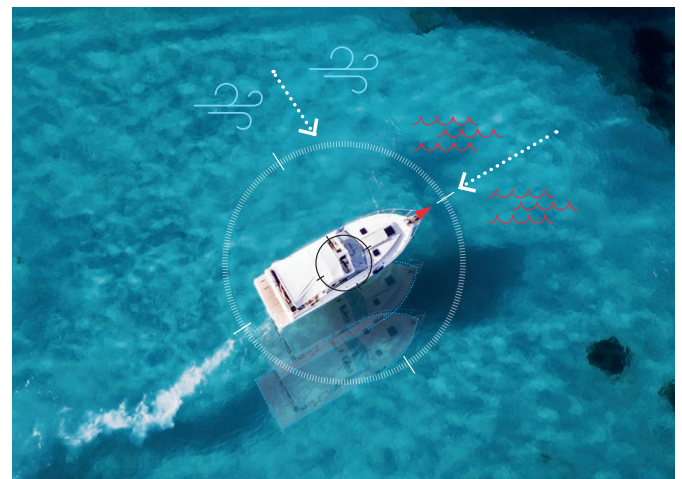
The ZF AutoTroll system provides infinitely variable propeller speed control when there is a need to run slower than the engine idle speed. AutoTroll allows operators to increase or reduce transmission slip to match the exact amount of thrust required during low-speed operation for extended periods without risking damage to the transmission.

Typical applications are:

- Slow-speed cruising
- Maneuvering in harbors and moorings
- Towing small boats
- Sport fishing at optimum trolling speed

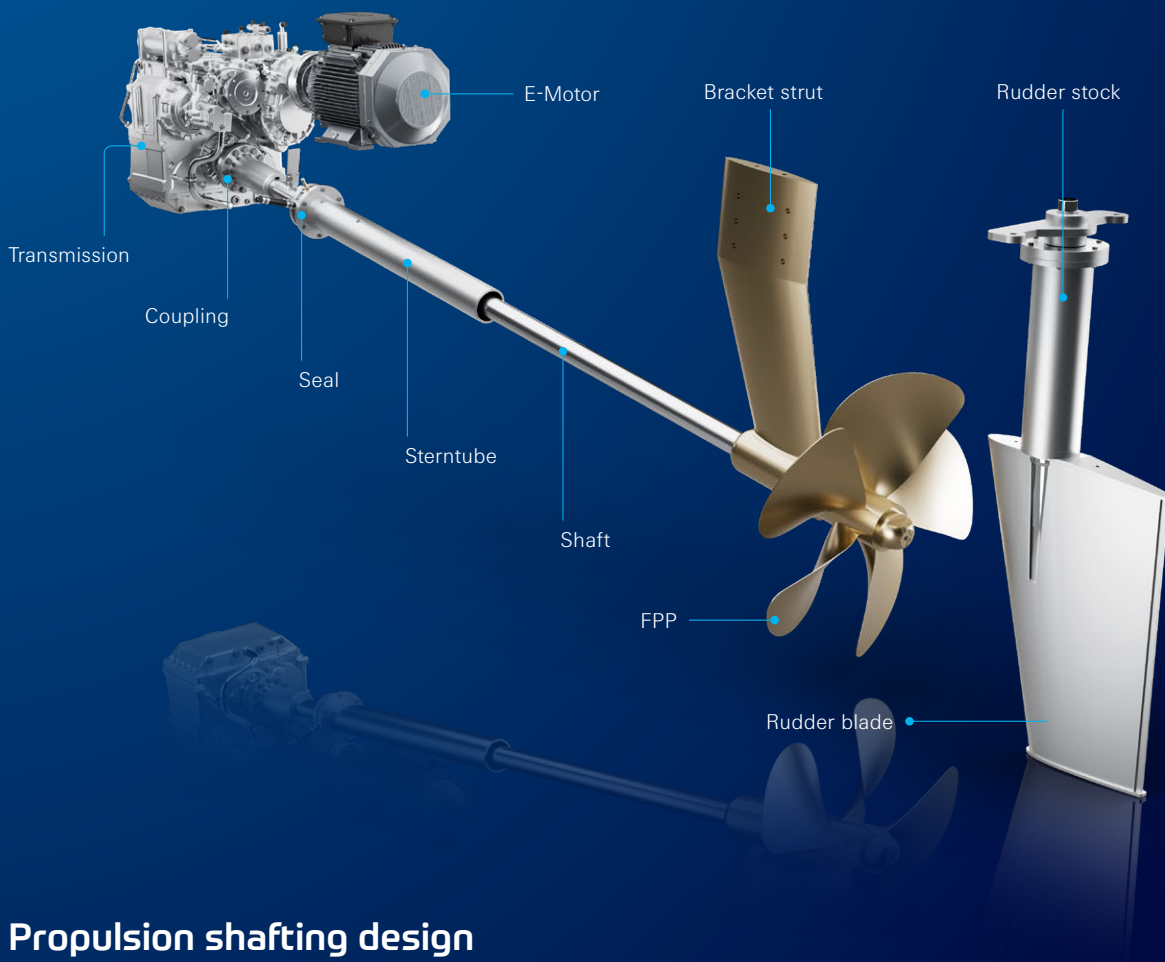


ZF iAnchor provides stable and seamless station keeping at the press of a button. The system holds a vessel's position and heading using an integrated GPS receiver and proprietary algorithms to compensate for wind and current.



Propulsion Package

Watersports boats, sport fishing vessels, cruisers, motor yachts, sailing yachts or commercial and fast craft vessels – different boat types require different types of propulsors. The ZF product range includes surface drives, sailboat propulsion and fixed pitch propellers, and thus offers the right propulsion for every application.



Propulsion shafting design

In order to extract the full power of the engines, ZF is able to offer a large variety of essential parts starting from the transmission all the way to the custom designed propellers. Being able to provide shafting designs by using the required shafting calculations means that ZF is able to suit each customer's different needs of performance, price and purpose. All our proposals offer the full ZF package from gearbox, couplings, seals, bearings, sterntubes, shafts, brackets to the propellers.

All these parts are machined and matched perfectly in our ZF Propellers factory in Kaohsiung (Taiwan) to offer the highest quality standards adhering to any IACS societies rules. Additionally, propeller blade thickness and stress levels can be checked using our purpose-built software taking into consideration non-uniform loading over the blade. This method is approved by most IACS societies and can be used as an alternative to the rules to make propeller blade thinner and more efficient.

Note: Shafting package currently available for the Asia region only



Surface drives

ZF SeaRex represents advanced and efficient technology in surface drives and is the perfect propulsion solution for high-speed boats. It also offers special patented options, such as automatically controlled trim and steering.

ZF SD SPP



Sailboat propulsion

Exceptional hydrodynamic efficiency and highest design flexibility – with unmatched maneuverability provided by the integrated joystick in the SPP version – are what characterize the ZF Sail Drive system. Ease of installation as well as its compatibility with a large variety of fixed and foldable propellers are additional benefits.



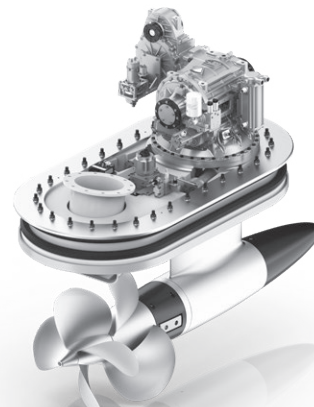
ZF Propellers



Fixed-pitch propellers

Custom-designed and standard fixed pitch propellers are specialties of ZF Marine. Propellers of various designs for all kinds of craft are available, employing sophisticated CAD-CAM design and manufacturing tools and meeting the highest standards in quality and efficiency.

ZF POD 4900



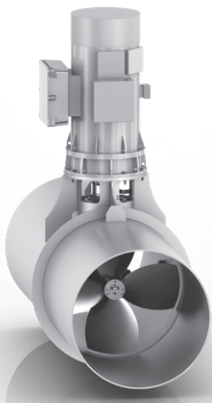
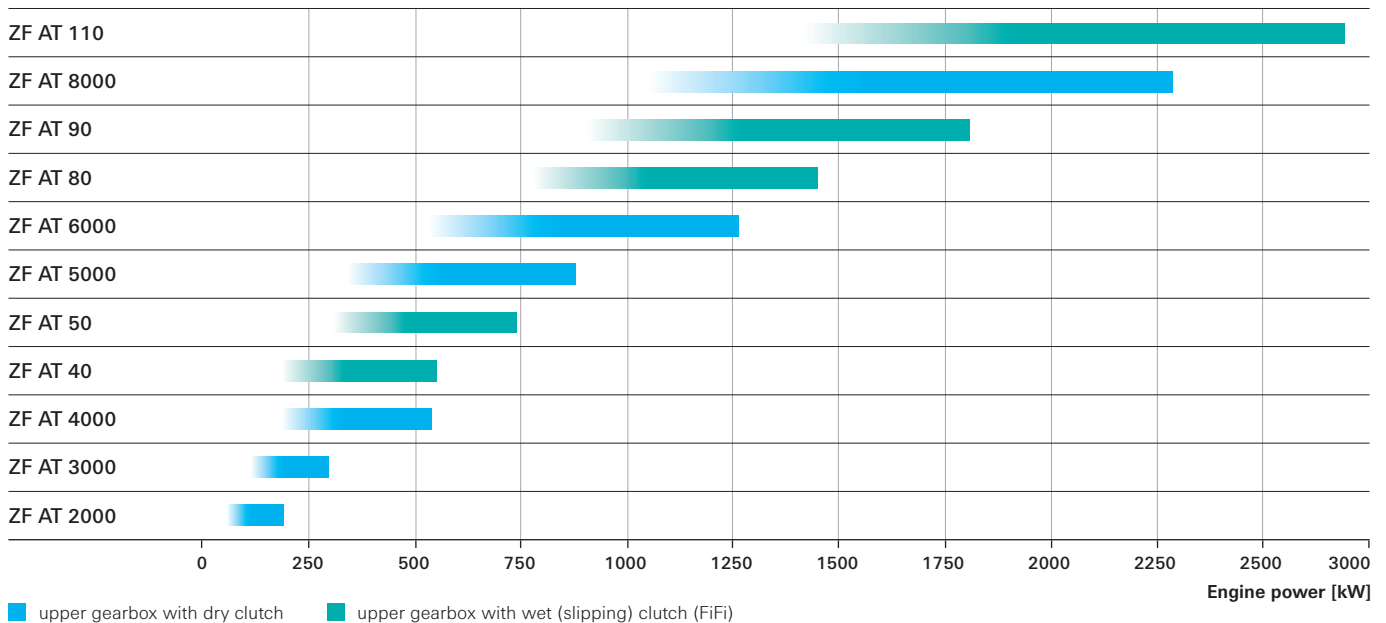
POD propulsion systems

ZF POD propulsion systems offer efficient propulsion and precise maneuverability for large vessels of all types. The systems ensure high comfort, reliability and optimized use of onboard space. Compatibility with all main marine OEM engines and an available PTI option enable flexible propulsion concepts. The POD 4600 covers up to 1,250 kW, while the ZF POD 4900 reaches up to 1,470 kW.

Thruster Systems

ZF Marine develops, designs and produces tailor-made thruster systems for all types of vessels. The product line comprises azimuth thrusters which are 360° steerable as well as transverse thrusters. The scope of supply includes the ZF ThrusterCommand control system.

Power range of ZF thrusters*



Fixed pitch tunnel thruster

Power range
Up to 3,065 kW

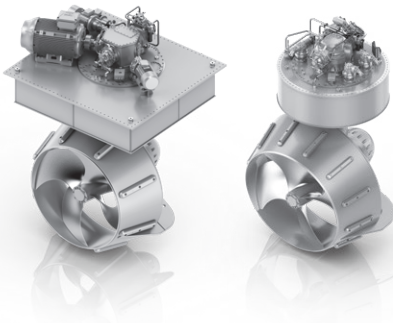
Versions
L-Drive
Z-Drive

Controllable pitch tunnel thruster

Power range
Up to 880 kW

Versions
L-Drive
Z-Drive

*Rating, subject to classification and application. The data shown are for reference only. Consult ZF Marine technical staff to determine applicable power for each specific use.



Well mounted azimuth thruster

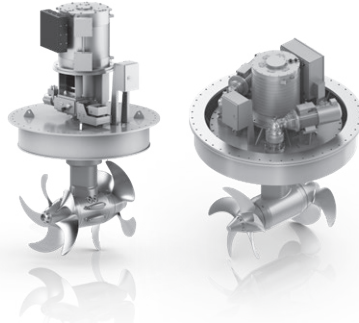
Power range

Up to 2,944 kW

Well mounted (placed below deck) azimuth thrusters, fixed pitch propeller, diesel, electric or hydraulic drive, optionally available in hybrid configuration

Versions

L-Drive (vertical input shaft)
Z-Drive (horizontal input shaft)



Contra rotation azimuth thruster

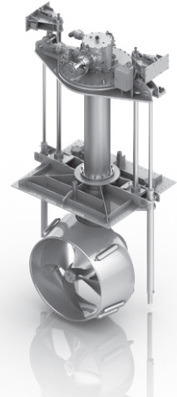
Power range

Up to 1,978 kW

360° steerable azimuth thruster with contra-rotating propellers for high efficiency and comfort on board, also available as compact version for certain options

Versions

L-Drive
Z-Drive



Retractable azimuth thruster

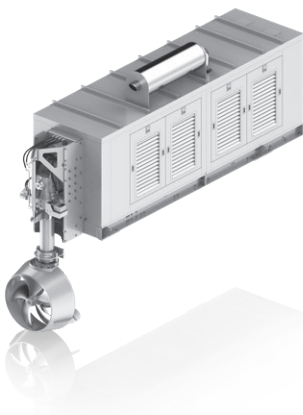
Power range

Up to 2,500 kW

Retractable azimuth thruster, mostly used as auxiliary or backup propulsion, designed for offshore applications like OSVs and PSVs

Versions

L-Drive
Z-Drive



Deck mounted azimuth thruster

Power range

Up to 1,330 kW

Deck mounted azimuth thruster placed on deck, containerized prime mover

Version

Z-Drive



Stern mounted azimuth thruster

Power range

Up to 1,380 kW

Versions

L-Drive
Z-Drive



Shallow draught thruster

Power range

Up to 825 kW

Shallow draught thrusters for use in shallow waters

Versions

L-Drive
Z-Drive

Control Systems

Reliable, responsive control systems for both mechanical and electronic applications are an essential element of ZF Marine propulsion systems.

ZF control systems are designed to smoothly interface with most engine options and our complete transmission range, either for leisure, professional or very heavy commercial applications. They comply with the highest classification standards, make installation easy for boat builders and operation comfortable for boat owners.

Whatever the application – from the most basic marine applications to large offshore supply vessels with highly sophisticated dynamic positioning equipment or luxury yachts – we provide the suitable propulsion control systems for mechanical or electronic engine and transmission operation.

All of ZF Marine's control systems carry our product "DNA", features that you will find across all of our control systems families like:

- "Plug and Play" installation for a simplified install
- Push-button setup for easy parameter configuration
- Neutral start interlock to prevent an unintended in-gear engine start
- Emergency reversal protection allows safe shifting from full ahead to full reverse in one motion

These features are evidence of ZF Marine's understanding of what safe and unobstructed boat handling is all about.



TotalCommand®



TotalCommand is a propulsion control family combining advanced functionality with ZF's industry-leading transmission technology. Improved clutch responsiveness, optimized proportional valve control and adaptive gear engagement ensure smooth shifting and seamless transitions between operating modes. CAN-bus communication enables automatic engine synchronization in all modes without the need for dedicated switches, ensuring consistent and reliable vessel behavior. The system supports up to six control stations with compact multifunction control heads featuring ergonomic levers, integrated touch pads and soft-touch buttons. Clear visual indicators and dual-color LEDs provide immediate feedback on neutral position, active station and gear engagement.

Integrated joystick maneuvering (JMS) coordinates engines,

transmissions and thrusters automatically, enabling precise and intuitive control during complex maneuvers such as docking, sideways movement and 360° rotation. JMS regulates engine speed and transmission engagement via automatic trolling valves for smooth, controlled operation. It is available as an open-loop system or as a closed-loop version with an integrated electronic compass that maintains heading and compensates for wind and current.

Rigorously tested and fully compliant with major classification societies such as ABS and DNV, TotalCommand is suitable for a wide range of commercial applications, from mechanically actuated systems to fully electronic propulsion setups. Control levers and the joystick have been designed by Giorgetto and Fabrizio Giugiaro, combining performance with premium design.

MiniCommand



MiniCommand is the evolution of standard electronic controls. MiniCommand provides affordable single- or twin-lever control of electronically actuated diesel engines and marine transmissions. Designed specifically for pleasure craft and light duty commercial vessels up to 60 feet in length, with a maximum of two control stations, the MiniCommand control processor incorporates the logic circuits for two engines and transmissions in one compact package.

SmartCommand®

SmartCommand, a powerful control system for electronically controlled engines and ZF transmissions, integrates the latest in CANbus technology with a user-friendly multifunction control head for up to six vessel control stations. SmartCommand provides complete control with dedicated control modes for all standard ZF Marine control system functions with the addition of Easidock and AutoTroll.



MicroCommander® / ClearCommand®



MicroCommander and ClearCommand are robust controls that have been long established as industry standards in electronic controls technology. Both systems are suited to applications utilizing mechanically actuated engines and transmissions or any combination of electronic throttle or shift. Premium ClearCommand was developed specifically for unique applications in multi-engine commercial and very large pleasure craft vessel applications. It is designed to interface with many commercially available DP systems and meets the stringent standards of most classification societies.



The ZF ThrusterCommand is designed to control a single azimuth thruster, providing follow-up steering- and propulsion control, as well as independent backup- and emergency stop functionality. Moreover, it is capable of interfacing with diesel engines and electric or hydraulic motors as a power source for propulsion. For steering the system interfaces with a hydraulic or electric steering system.

Wheelhouse

Control panel AT

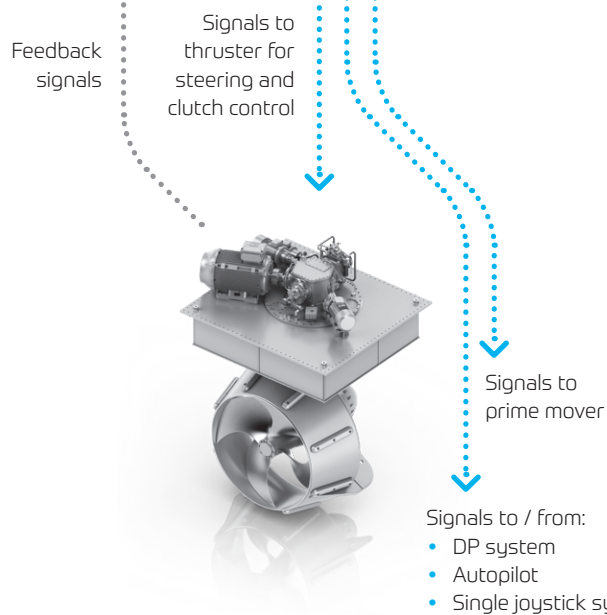


Control panel TT



Thruster room

TCU

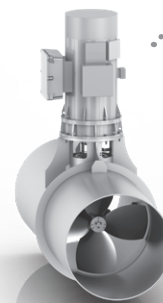


TCU



Diagram illustrating the control system for the Thruster room (right side):

- Control panel TT** (Wheelhouse) is connected to the **TCU** (Thruster Control Unit) via a dotted line.
- The **TCU** sends **Signals to drive for speed and direction control** (indicated by a blue arrow) to the thruster.
- The thruster sends **Feedback signals** (indicated by a dotted line) back to the TCU.



ZF Aftersales-Service for Marine Applications

From our Product Competence Center (PCC) we are able to provide full support for systems, components and software. Support comes directly from the production and development departments of our products. Especially during the launch of new products, the close cooperation between aftersales, product development and production is key to success. We have the operating and maintenance procedures defined and the product and service documentation is ready.

Each PCC has state-of-the-art equipment to test products and components to train our network on a particular product. To ensure rapid availability of parts for the entire network, each PCC has an independent aftersales warehouse and a dedicated customer service team. The team of service technicians at each PCC is always ready to back up our local partners. This guarantees prompt solutions for our customers.



Product Competence Center (PCC) Commercial / fast craft transmissions

Location: Friedrichshafen, GERMANY

Product range: Commercial / fast craft transmissions



Product Competence Center (PCC) Commercial craft thruster systems

Location: Krimpen aan de Lek, NETHERLANDS

Product range: Commercial craft thruster systems



Product Competence Center (PCC) Pleasure craft applications

Locations: Arco (TN), ITALY
Padova (PD), ITALY

Product range: Pleasure craft applications



Product Competence Center (PCC) Commercial/fast craft and pleasure craft applications

Locations: Kaohsiung City, TAIWAN

Product range: Fixed pitch propellers for pleasure craft and commercial/fast craft applications

SERVICE MATTERS

Our service offers:

- Product registration
- Transmission retrofit and modifications
- Repair and testing
- Scheduled maintenance
- Preventive maintenance and overhauls
- Spare parts and spare units
- Integrated logistic support
- Training



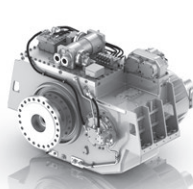
Find your nearest service location and go to www.zf.com/marine-service



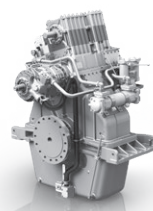
ZF 9300 PTI



ZF 40000



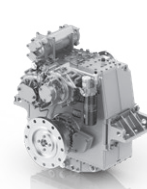
ZF 60000



ZF W11000 series



ZF 3000



ZF 3360 ENC



Well mounted azimuth thruster



Contra rotation azimuth thruster



Deck mounted azimuth thruster



Retractable azimuth thruster



Shallow draught thruster



Tunnel thruster



Control panels



Control levers / joysticks



Control systems



ZF 400



Surface drive systems



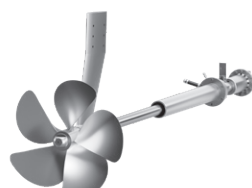
Sail drives



POD propulsion systems



Standard and custom-designed propellers



Propulsion shafting design

Think Globally, Act Locally

Whenever a major marine project is launched anywhere in the world, ZF is likely to be among the potential technology partners.

Commercial, leisure and governmental vessels around the globe are already equipped with ZF marine propulsion technology. With development, production, and service facilities worldwide, ZF remains close to its customers and their markets. A comprehensive international service network provides maintenance, technical support and spare parts to help ensure reliable vessel operation throughout the product lifecycle.





115

Countries supported by
ZF Aftermarket globally



33

Aftermarket plants and
remanufacturing sites



650+

ZF Aftermarket and Service Partner
locations close to our customers



90+

Years of marine engineering expertise



Smart Propulsion

As a continuous innovator, ZF is driving advancements in marine propulsion and intelligent connectivity solutions that will further improve productivity and efficiency for different segments and markets. Extending high-performance mechanical systems with digital services opens up new potential to optimize the productivity of marine operations.

Condition monitoring for ZF marine transmissions

ZF Condition Monitoring combines intelligent data acquisition with advanced software-based analysis to continuously assess the condition of marine transmissions. By detecting potential issues at an early stage, it enables condition-based maintenance, improves maintenance planning and helps reduce unplanned downtime and operating costs. Fleet operators gain greater transparency, more reliable operations and a sound basis for faster, data-driven decisions. This supports efficient fleet management while helping operators meet growing requirements for availability, safety and regulatory compliance. For greater peace of mind at sea – and the confidence to keep your fleet moving.



Condition monitoring

Data-driven decisions

Reduced downtime



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