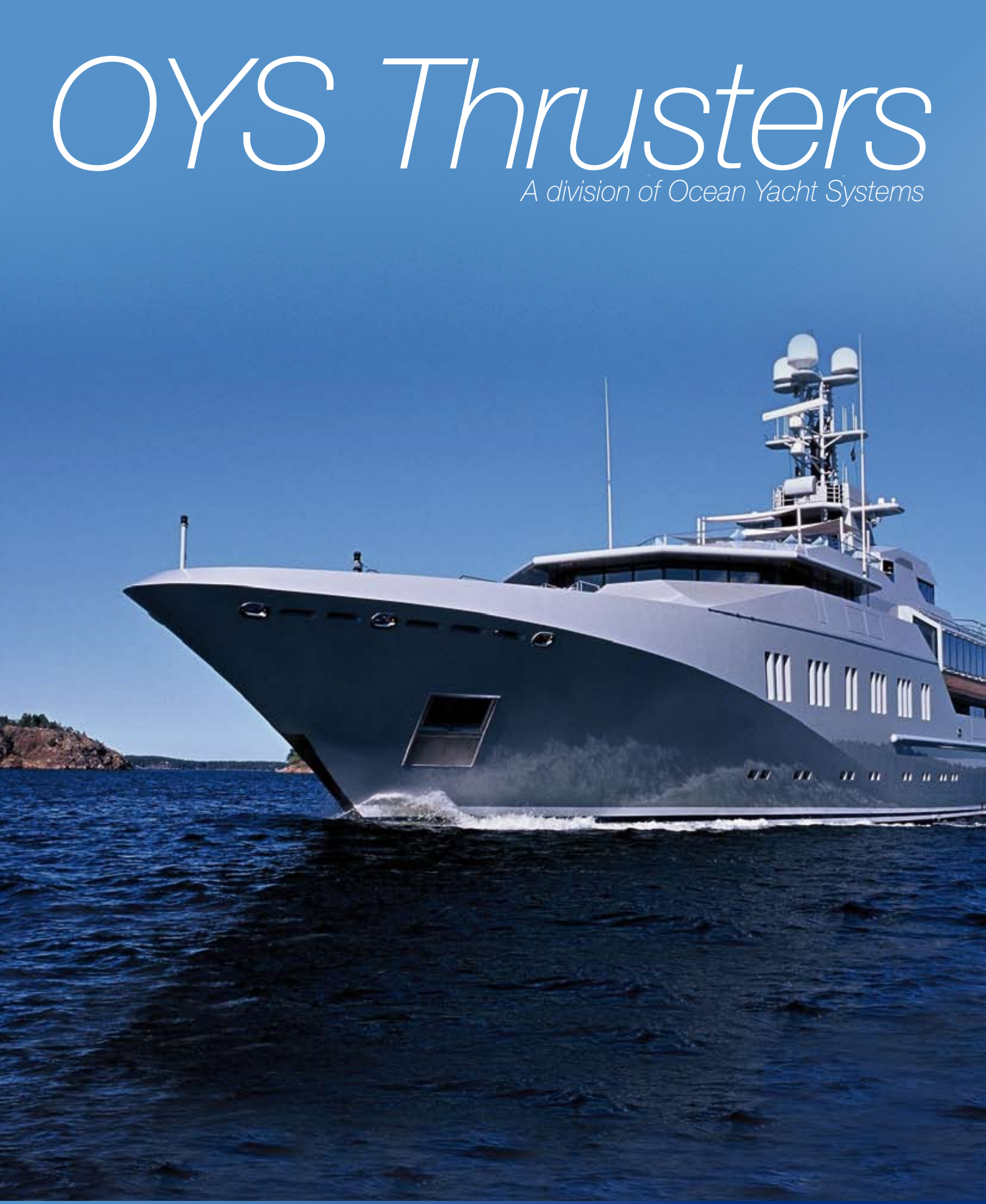
OYS Thrusters

A division of Ocean Yacht Systems



OYS

THRUSTERS

OYS Thrusters – *The History*

Reputation

OYS Thrusters was launched in 2006 as a division of Ocean Yacht Systems Limited (OYS), one of the world's leading suppliers to the Superyacht and high performance yachting market. Having built a well established reputation for delivering leading edge rigging and hydraulic systems for hundreds of high profile vessels, OYS launched a new division to design and manufacture a wide range of thruster systems including bow and stern thrusters, fixed and retractable thrusters with hydraulic or electric drives, available to the leisure and commercial powerboat and sailboat market. Superyacht projects such as Adele, Athena, Ghost, Mari-Cha IV, Mirabella V and Tiara are just a few examples of rigging and hydraulics solutions delivered by OYS to meet the ever increasing demands of new Superyacht owners, offering unparalleled standards of quality, reliability and superior finish.

Organisation

OYS was established in December 1997, filling a gap in the market place. Since formation of the company, strategic efforts have been primarily focused upon the Superyacht and large race boat market, with particular attention to the application of quality controls employing techniques successfully used in the aerospace industry. This emphasis has resulted in the capture of many large and ground breaking projects, all of which have been successfully completed.

Technology

Operationally, the company concentrates on its core competencies of custom machining and project management, with the smaller production element sub contracted. Design and product development is where OYS maintains its leading edge, with a continual investment programme resulting in the use of the latest CAD/CAM systems, Finite Element Analysis (FEA) and structured ERP systems as the normal tools of the trade.

All of this infrastructure development has been matched by the investment in key experienced personnel who have the capability to ensure our performance and standards are continually improving. The company has not only invested in the area of product development, but has poured a significant amount of resource into operational and technical development, with modern design and manufacturing headquarters based at Bournemouth International Airport, UK.

This ultra modern facility has been specifically designed to house the expanded design, production, assembly and test departments for both rigging and hydraulics manufacture in addition to the rapidly developing architectural rigging and bow thruster product range. It also incorporates bespoke test facilities used in the engineering, development and production of hydraulic and composite products. A composite test bed with a length of 60 metres and a break loading of 120 tonnes, a 1600 Ton Heading Press with the capacity to comfortably head (76.20mm dia) rods, a coil straightener capable of handling –0150 (25.40mm dia) Nitronic 50 coil and hydraulic test rigs for both pressure and cyclic testing are the key investments.

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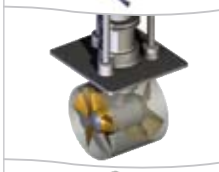

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OYS Thrusters

Even the most skilled Captains need assistance combating sudden wind shifts, strong currents or congested marinas. With the addition of bow and stern thrusters you vastly reduce the risk of damaging your vessel, or someone else's vessel. Thrusters provide you with greater confidence and control when docking, especially when you are shorthanded or cruising with inexperienced guests.

Traditionally only fitted to luxury yachts and large commercial vessels, the benefits of bow and stern thruster systems are now accessible to all manner of motor and sail vessels from (14 to 100 metres). OYS Thrusters introduce a new series of bow and stern thruster systems designed to provide any yacht optimum manoeuvrability with silent and reliable operation, ranging from our standard dual propeller thrusters up to our full 360 degree Azimuthing PumpJet thruster systems.

OYS Thruster Series

- **BTM** Bow Thruster Systems
- **BTE** ElectroPod Thruster Systems
- **BTH** Hydraulic Thruster Systems
- **RTH** Retractable, Rotatable & Swing Thruster Systems
- **PJT** PumpJet Yacht Thruster Systems
- **EDS** Sail Drive Auxilliary Propulsion Systems

BTM Series

Bow and Stern Tunnel Thruster Systems

The BTM Series utilises our dual propeller counter rotating design, a highly efficient thruster system developed to recover lost rotational energy and optimise thrust within a very small tunnel diameter. The drive motor is mounted directly to the thruster using a hollow shaft configuration (standard SAE / DIN sizes) for input shafts from electric or hydraulic motors or from an optional stub shaft configuration (for direct drives). This system eliminates the need for adapter housing and couplings and reduces vibration by using rubber isolation mountings. The complete thruster unit is compact, efficient, silent and ruggedly designed for the Superyacht of the future.

OYS Thrusters are designed with spiral bevelled, case-hardened, right angle gears suitable for electric and diesel engines, or hydraulic drives. The versatility of the BTM Series means that installation of the drive can be performed vertically or horizontally. Any installation can be tailored to suit the needs of a specific vessel design, offering potential space savings and convenient maintenance access. The thrusters' hollow-shaft drive and propeller shafts are made of high tensile stainless steel, and contain anti-friction taper roller bearings. The BTM thruster pod is completely removable from the tunnel, offering better serviceability and the future potential for retro-fitting. The BTM Series of bow and stern thrusters are available from 20 to 200 BHP (horsepower).

BTM Series Continued

Thruster Systems That Whisper

OYS Thrusters robust series of electric bow thruster systems utilise AC electric motor drives with variable speed frequency converter technology to minimize noise and cavitations. All systems come complete with a variable speed electric drive and full bridge controls.

Thruster Specifications
Dual Propeller-Counter Rotating Thruster Systems

Model	Power (max)		Input Speed	Thrust		Tunnel Diameter	
	hp	kw	rpm	lb	kgf	inch	mm
10BTM	20	15	1800 (1500 rpm available)	560	255	10	254
12BTM	30	22		840	380	12	305
16BTM	65	49		1820	825	14	356
20BTM	100	75		2800	1275	18	457
24BTM	130	97		3640	1650	20	508
28BTM	200	150		5600	2545	24	610

The hydraulics range of the BTM Series is designed around closed loop hydraulic circuits using piston pumps and motors for maximum efficiency. Variable speed systems can be employed through the use of variable displacement pumps or a variable flow control valve. The closed loop system requires a small oil reservoir for oil replacement and cooling.

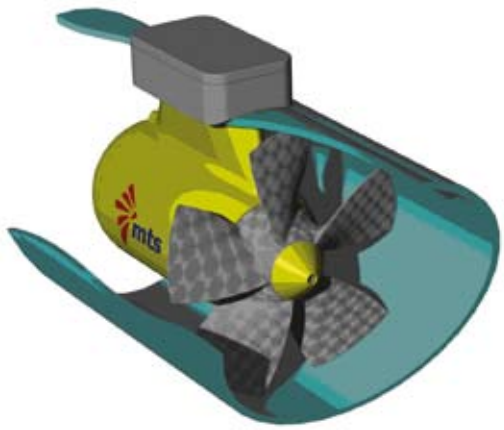
OYS Thrusters also offer open loop hydraulic control circuits which are used for hydraulic system integration where other hydraulic sub-systems are operated from a common hydraulic system. Components often used in this configuration are: passerelles, windlasses, stabilizers, cranes, winches, bilge pumps, generator drives and auxilliary propulsion systems.

ElectroPod Thruster Systems

The BTE series of unique electric propulsion thrusters exploit Azipod® Technology to incorporate the electric motor as an integral part of the thruster hub, creating “silent systems” that are, efficient, compact and lightweight, thanks to carbon-fibre propeller technology. The thruster tunnel pod ratios are rationalised to optimise flow conditions. OYS Thrusters’ ElectroPod systems are half the weight of standard electric bow thruster systems and offer very simple installation. However, the biggest benefit of this system is that the unit is completely sealed and can be installed inside a water or ballast tank without the need to drain or build a separate dry compartment, vastly improving installation time and cost. Furthermore this system offers excellent potential for future retro-fitting.

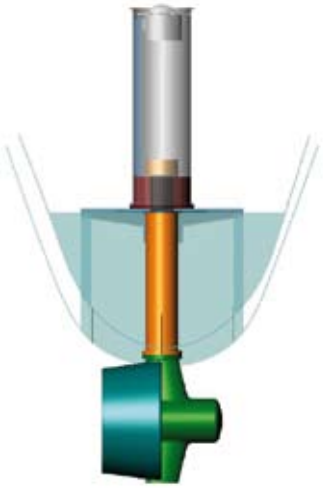
ElectroPod Thruster Systems are available as:

Bow / Stern Thrusters

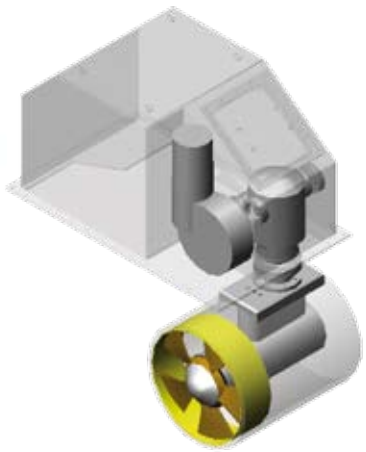


Retractable Thrusters

with optional 360° rotation and kort type nozzles



Retractable



Swing

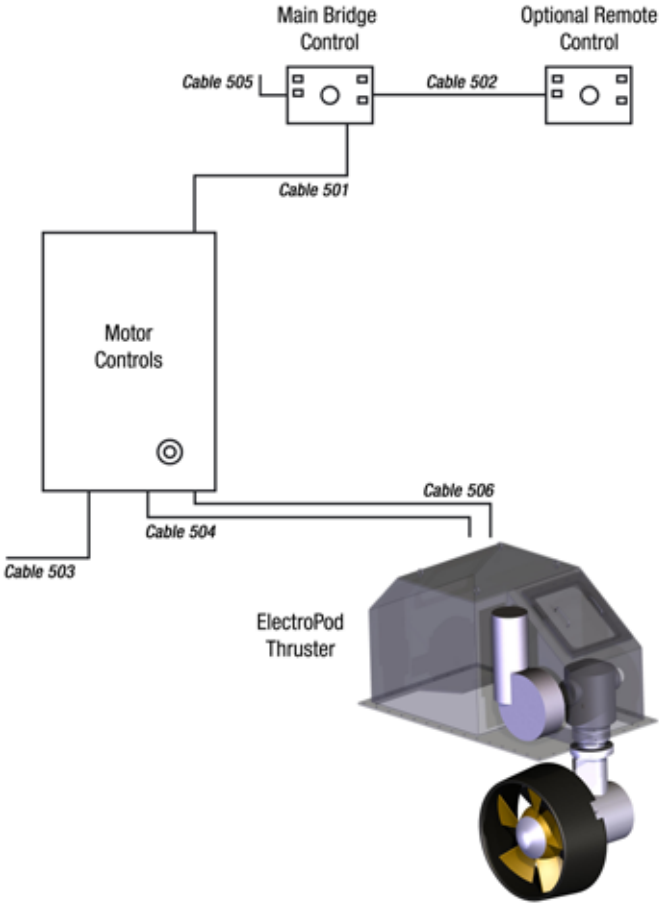
The BTE Series of ElectroPod Thrusters are available from 25 to 250 BHP (horsepower).

ElectroPod General Specifications								
Model	Power (max)		Amps	Thrust		Tunnel Diameter		Propeller
	hp	kw	I	lb	kgf	inch	mm	rpm
20BTE	20	15	26	460	210	14	356	1800
30BTE	35	26	49	800	365	16	406	1600
50BTE	55	41	66	1260	575	18	457	1400
75BTE	75	56	96	1725	785	24	610	1000
100BTE	100	75	137	2300	1045	24	610	1000
135BTE	135	100	185	3100	1410	28	711	900
160BTE	160	120	226	3680	1675	32	813	800
200BTE	200	150	284	4600	2100	36	914	700
250BTE	250	185	344	5800	2615	44	1118	580

Currents shown are listed at 440V AC. 3 Phase, 60 Cycle systems, with 380V AC/3/50 are available upon request. ElectroPod thrusters are rated for continuous duty, seawater cooled, Class H insulated with Class F temperature rise, 40° C Max coolant temperature.

System Outline

The entire system is designed for easy installation, connection and service. The major components installed include the thruster, motor controller, bridge console and remotes if required. All electrical interfaces are clearly marked and ready for connection.



Motor Controller

The *ElectroPod Thrusters* variable-speed controller is an inverter type design offering variable torque. This provides full speed, uni-directional control to the bow thruster.

The use of the inverter motor controller prevents motor in-rush current problems from occuring and therefore the soft start (no load condition) ensures that the generators can handle the starting current problems inherent to other types of motor controllers.

The motor controller is remotely operated by the bridge-mounted variable-speed joystick controller. Remote control stations are available upon request.

Hydraulic Integrated Thruster Systems

OYS Thrusters' BTH Series provides the "complete package" of hydraulic thruster systems. The scope of supply includes all the necessary components for the basic thruster system. The hydraulic pump is assumed to be driven by a constant speed engine (e.g. generator set) with adequate and available horsepower.

OYS Thrusters are rated for continuous horsepower, delivering full thrust every time. The tunnels are available in stainless steel, fibreglass or aluminium, with a four bladed NAB propeller and mounting saddle. The BTH Series of hydraulic integrated thrusters are available from 20 to 115 BHP (horsepower).

Hydraulic Bow and Stern Thruster Kits						
Model	Power		Hydraulic System		Tunnel Diameter	
	hp	kw	l/m	bar	inch	mm
10BTH	20	15	48	210	10	254
12BTH	35	26	82	210	12	305
16BTH	50	37	125	240	16	406
20BTH	75	56	155	240	20	508
24BTH	115	85	220	260	24	610

Tunnels are offered in stainless steel as standard with the option of supply in fibreglass or aluminium.

Hydraulic reservoir is ready to be installed in the vessel. All components are tank mounted. The reservoir includes; the tank, return line filter, filler/breather cap, sight glass, level alarm switch and high oil temperature alarm switch. The tank is sized for intermittent duty. For continuous duty rating, a heat exchanger is generally recommended.

Hydraulic manifold includes the bow thruster directional control valve and the system pressure relief valve as a complete assembled unit ready for installation.

Hydraulic pump (main drive) is of a piston type design with input speed calculated at 1800 rpm (1500 rpm systems available). The circuit is open loop and can therefore be integrated with other hydraulic sub-systems.

Main bridge control console is panel mounted and includes a joystick controller providing port-neutral-starboard thrust commands, a system power switch which includes a contact for clutch operation (customer furnished), low oil level and high oil temperature alarms.

Note: For variable speed, main engine drives, or any other application, please contact our engineering team for further assistance.

RTH Series

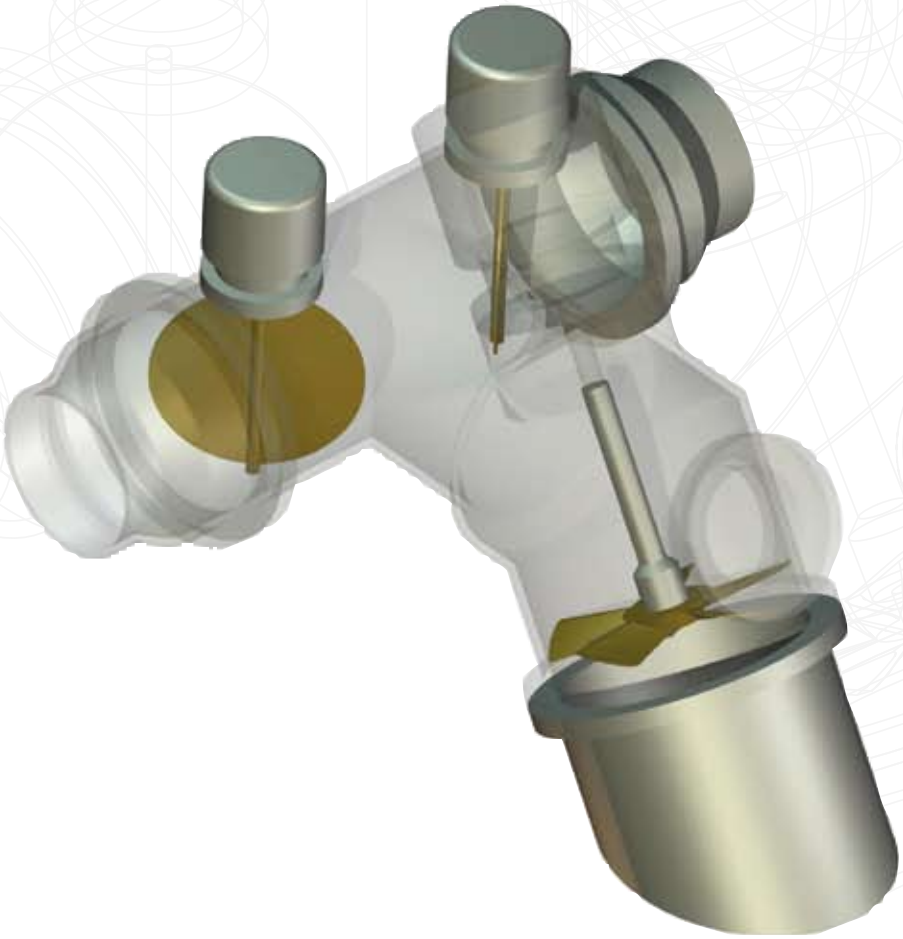
Retractable and Swing Thruster Systems

OYS Thrusters' RTH Series of tunnel style thruster systems are designed as fully retractable units. Each system comprises retractable / extension actuators and full bridge controls. A swing configuration is also available. The retractable thruster series is best suited for high performance, fast planing sailing yachts and fast planing semi-displacement hulls, where the thruster in its raised position, gives a completely clean-faired hull section, with little or no drag. The RTH Series thrusters can be mounted forward, in vessels with a shallow forefoot, allowing the retraction strut deeper immersion, increasing thruster efficiency. The thruster is driven, raised and lowered hydraulically and locked in its drive position. The RTH Series of retractable and swing thrusters are available from 25 to 150 BHP (horsepower).

Leading the forefront in development of low weight, high performance, and reliable thruster systems, OYS Thrusters has developed the dual propeller, counter rotating, retractable thruster system, using carbon fibre composites for the major components in its construction. This includes the propellers, thruster hub and mounting base plate.

PumpJet Thruster Systems

Offering dynamic side power and tailored for yachts up to 100 meters, PumpJet thruster systems offer high thrust to horsepower ratios, ideal for high-speed yachts. Small nozzle openings in the thruster offer reduced drag over a similar tunnel thruster system of the equal power. PumpJet systems are installed within the ship's hull lines ensuring that no equipment protrudes. They do not need to be extended or retracted, have no minimum submergence requirements and are extremely quiet under operation, making PumpJet thruster an ideal choice for sailing yachts. OYS Thrusters' PumpJet systems are available from 25 to 250 BHP (horsepower).



Azimuthing PumpJet Thruster Systems

Our new Azimuthing Bow Thruster Systems are designed for a fine faired, or bulbous bows. The Azimuthing PumpJet design is based on experience gained in the offshore naval patrol boat market and offers vessels dynamic manoeuvrability in harbours, standby slow speed propulsion and emergency steering with a “Get me Home System”. OYS Thrusters’ Azimuthing PumpJet systems are available from 25 to 250 BHP (horsepower)

Our Azimuthing PumpJet thrusters can replace a standard tunnel thruster system and offer many advantages over retractable or swing type thruster systems, by providing fully rotating thrust through 360 degrees. The Azimuthing PumpJet system is mounted with no vulnerable parts protruding past the yachts hull and can include a closure plate protecting the system when not in use. It is simple to operate, trouble free, offers extended life and is very economical.

Azimuthing PumpJet Thruster Systems can be driven hydraulically, by electric motor or by using a direct engine drive. They utilise the latest control technology and can be furnished as complete systems to provide;

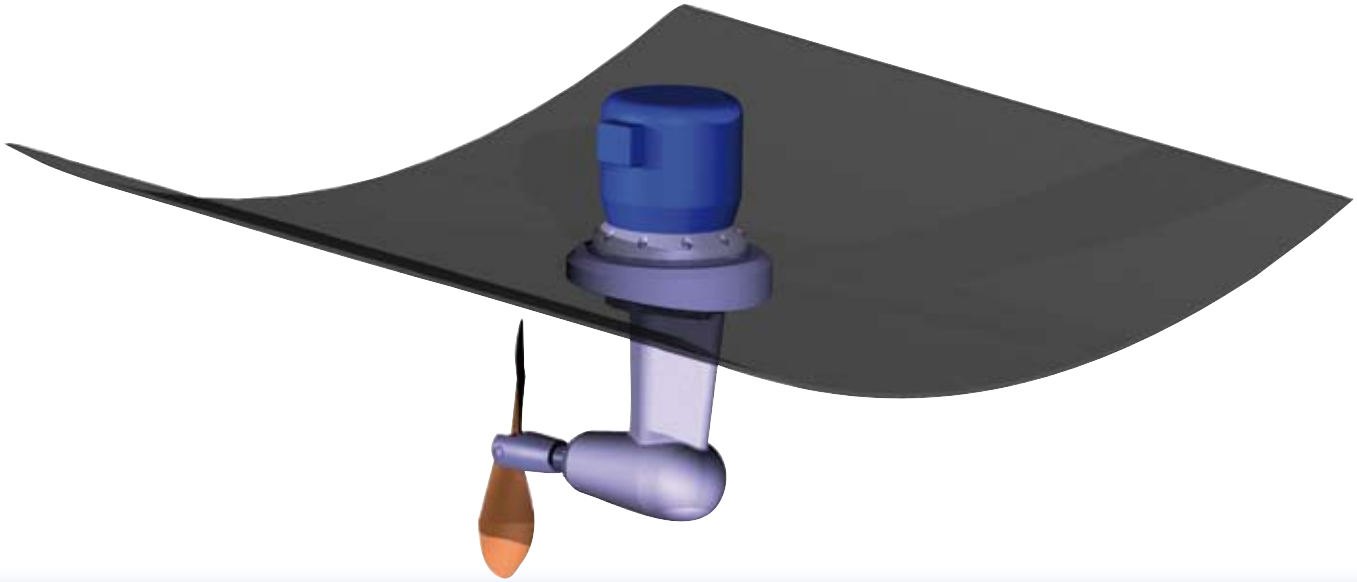
Optimum Manoeuvrability and Reliability, Simplified Installation and Operation

Electric Drive Systems for Sailing Yachts - A silent sailing revolution

There is hardly a more enchanting and natural experience than sailing a yacht quietly and peacefully with light wind in calm waters at moderate speeds. This marvellous feeling has always been the envy of every sailing yacht owner. This can now be achieved with a new sail drive concept. The EDS Drive is a new electrical drive system for sailing yachts. Instead of coupling the engine to the propeller shaft, a generator supplies power directly to the electric drive. The new EDS drives are so quiet that they are practically inaudible at normal operating speeds. In additional the EDS drive offers immeasurably better fuel savings than conventional diesel engines.

Permanent magnetic, brushless type AC/DC EDS drives provide the yacht thruster market with numerous advantages. By incorporating the winding in the stator and using permanent magnets on the rotor, the thruster motor benefits from a higher thermal efficiency and reduced rotor inertia versus that of brush-type motors. OYS Thrusters EDS Drives are available as;

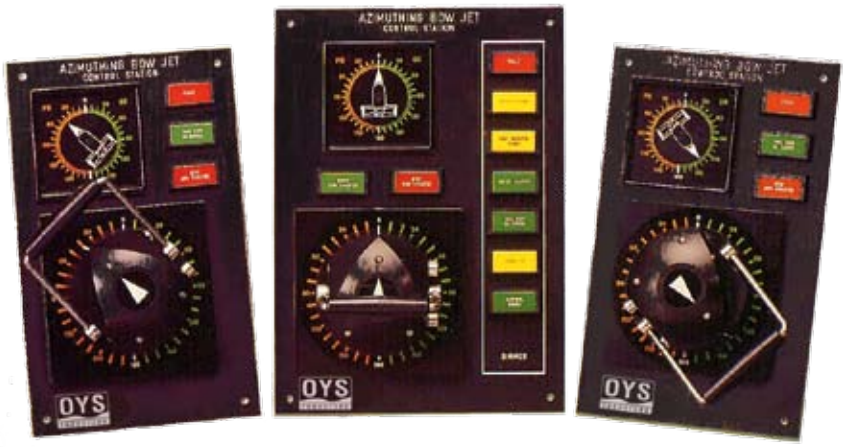
- *Direct shaft driven systems*
- *Sail drives*
- *Steerable and retractable sail drives*



Control Systems for Thrusters

OYS Thrusters offer a complete range of integrated thruster control systems from simple proportional “Joystick Controllers” to a full 360 degree Azimuthing control system.

Used in combination with a standard bow thruster and an Azimuthing stern thruster, the JSC4200 Control System allows a vessel to hold a stable position and heading, without using the anchor or running the main engines (Electric Drives). OYS Thrusters have designed and developed a system that is suitable for up to Beaufort 3 to 4. An electronics unit linked to the GPS relays information to both the bow and stern thrusters, which react accordingly to maintain the boat’s stationary position. The JSC4200 system offers some of the key features of a Dynamic Position System (DPS) but without the high costs involved.



Frequently Asked Questions

Electric Drive Systems for Sailing Yachts

1. I have used small DC electric bow thrusters available on the market and have found them to be limited in duration and very noisy. How do your electric BTE series bow thrusters compare?

The BTE Series of electric bow thrusters utilise Azipod technology in that the brushless DC motor is designed as an integral part of the hub with a direct shaft drive. There are no gear reductions thus reducing noise and the e-motor is rated for continuous duty in both directions (seawater cooled, Class H insulation with Class F temperature rise). In addition, we use a carbon fibre propeller that can flex with blade loading reducing noise levels and cavitaion.

2. The dimensional drawing I saw for the BTM series shows dimensions for a fibreglass tunnel. My yacht is in steel so do you have other tunnel materials available?

We can furnish tunnels in fibreglass, aluminium or marine grade steel. All tunnels are available with material classification approvals.

3. I am interested in the BTM Series dual propeller retractable thruster in your brochure, but I do not have the head room available for such a configuration. Are other options available?

Both the BTM and BTE Series of thruster systems are available in a straight vertical retractable configuration or for applications with minimal head room a swing type unit is preferred. For extra performance i.e. thrust, a kort type nozzle is available.

4. Can you explain the difference between the BTM and BTH Hydraulic Thruster Series?

The BTM Series has the hydraulic motor mounted to the outside of the thruster unit and is designed with a hollow shaft input configuration so no coupling or adaptor is required. The BTH Series has a piston type hydraulic rotating group design as part of the thruster hub with a direct shaft driven propeller. The BTH Series is supplied only as a single propeller design.

5. Do you manufacture the BTE and BTM as a Stern Thruster System?

We offer both the BTM and BTE in a stern thruster configuration. Normally this means that the unit is supplied with just a tunnel (similar to the bow unit) or a mounting frame for transom mounted thrusters.

6. I am very interested in the BTE series of electric thrusters but am nervous about what happens if seawater gets into the unit. My experience has shown that if a seal can leak, it will!

The BTE Series is designed to prevent leakage. Typical bow thruster systems are prone to water ingress or oil leaking through the propeller shaft seals. The ElectroPod thruster design eliminates this problem through the introduction of an internal sealed diaphragm located between the rotor and stator, creating two separate isolated and sealed compartments. Water cannot reach the stator and electronics through the shaft seal. OYS Thrusters are the only bow thruster manufacturer in the world to offer this concept.

7. Do you supply commissioning engineers and who are your service representatives?

We offer commissioning or service engineers upon request. Please refer to our website for a listing of service representatives.

8. I plan on speaking to various thruster suppliers about my upcoming project, do you exhibit at any of the major international boat shows?

OYS Thrusters annually exhibits at the following International Boat Shows: Monaco (France), Fort Lauderdale (USA), METS (Netherlands), and Dusseldorf (Germany). Please refer to our website for details.

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