WÄRTSILÄ

Wärtsilä Steerable Thrusters

The Wärtsilä Steerable Thruster (WST) has been developed in parallel with the latest operating demands for tugs, river-going vessels, and various offshore support vessels.

The aim, as with all Wärtsilä products and solutions, is to ensure optimal efficiency, high hydrodynamic performance, less maintenance and better accessibility for serviceability. With eight thruster types, ranging from 700 to 3200 kW, the WST enables these vessels to meet and exceed the performance levels required for today's competitive operating environment. By maintaining outstanding efficiency at different power outputs, the WST reduces costs for owners and operators. The design also allows easier and faster installation, thereby saving time and costs for the yard.

Designed to Meet the Latest Customer Needs

Superior performance: Large propellers with a tailored design, a smooth housing shape and slender nozzle connections ensure the superior performance of the Wärtsilä Steerable Thrusters. The hydrodynamic design has been thoroughly optimized, with the use of Wärtsilä's extensive design experience combined with computational fluid dynamics (CFD) capabilities. Since not all vessel performance requirements are the same, the WST comes with a choice of two nozzle types.

– Bollard pull nozzle: A nozzle optimised for bollard pull, providing outstanding performance at zero knots vessel speed.

– Free sailing nozzle: this shorter and lighter nozzle version is designed for free sailing efficiency at speeds of 10-14 knots, whilst keeping good bollard pull capabilities at low vessel speeds.

WST combines its excellent bollard pull capabilities with continuous steering over 360°, to provide maximum thrust in any direction.

High-speed engine compatible: The Wärtsilä Steerable Thruster fits well with Wärtsilä's own medium-speed engines and is also compatible with high-speed engines of other brands. With a selected range of gear ratios, all common engine speeds between 750 and 1800 rpm can be accommodated, as well as electric motors with speeds between 720 and 1200 rpm.

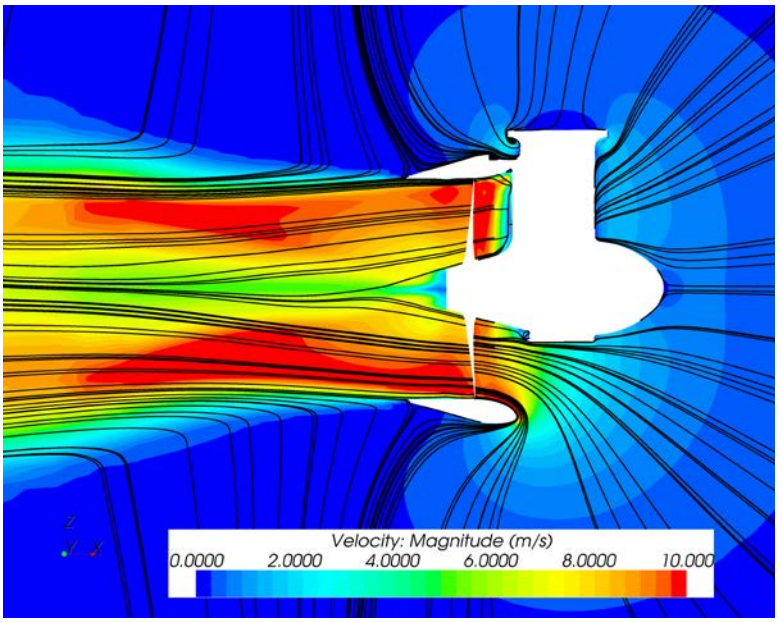
Efficiency: A high level of manoeuverability is essential, and the WST is designed to achieve this with an optimal hydrodynamic efficiency. All functionality provided by the individual components of the steerable thruster, the propeller, the engine, the clutch to control the thrust and the steering system is combined in an integrated design that attains overall high efficiency with the desired manoeuvrability. At the same time, the system is simple, straightforward and reliable.

Robust & reliable: Since operational reliability is important, Wärtsilä places high priority on the robustness of all components used in its products and solutions.

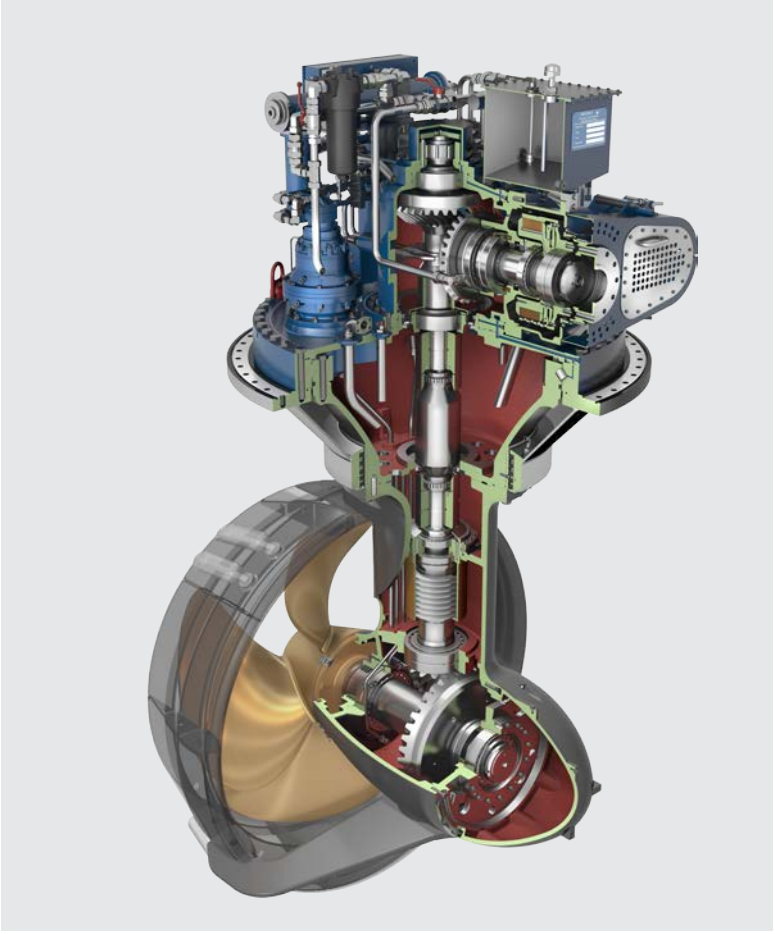
Environmental performance: At the same time, the thrusters come with an advanced sealing system that includes functionality for seal monitoring. The Wärtsilä Steerable Thrusters are suitable to be operated in US inland and coastal waters under the US EPA VGP2013 regulations. Compliance is achieved by using either environmentally acceptable lubricants (EAL) or barrier seal solutions, depending on thruster size and propeller type.

Installation flexibility: The WST can be installed and mounted in various ways. These include bolt-in (standard) and weld-in possibilities with easy to install hull fairing. This flexibility, together with the option to incline the thruster to align it with the hull, enables optimal positioning of the thruster with regard to thrust performance and system layout. Mounting from above (can-mounted), below or split mounting allows the yard to optimise the building scheme. Similarly, the high level of integration eases the installation at the yard.

Compact & integrated: By integrating all the auxiliary equipment needed to operate the thruster, such as the hydraulics for the clutch and the lubrication and steering systems, onto the top plate around the upper gearbox of the mechanical Z-drive system, a truly compact solution is achieved. This means that less thruster room space is needed. The modular design also allows the same compact and integrated layout for thruster variants with controllable pitch propellers that have additional pitch hydraulics. In case of a diesel-electric propulsion system, a thruster configuration with electrical steering and an electric lubrication pump set is available.



Wärtsilä Thruster Nozzle (WTN) optimised for bollard pull



Wärtsilä Steerable Thruster with PTO for diesel-mechanical drive

Wärtsilä ProTouch
Steerable thruster lever and
side display

User friendly controls: The thrust, steering, and auxiliary system functions are all controlled by the Wärtsilä Propulsion Control System. The ProTouch panel design is space saving and designed to allow easier and more intuitive operation of the thruster functions. Installation of the control cabinets, panels and cabling is straightforward since all components of the propulsion control system are interconnected by means of CAN-open buses.

Ice Class: The increasing demand for thrusters with ice class is included in the design of the Wärtsilä Steerable Thruster. Ice Class can be specified for winter sea conditions or to provide extra robustness to withstand impacts, such as from driftwood. The thrusters are compatible with Finnish-Swedish Baltic Ice Class, Russian Ice class (RMRS), and Russian river ice class (RRR). The Finnish-Swedish Ice Class (FSIC) rules are implemented in the rules of many major classification societies.

Wärtsilä Services

Easier maintenance: The WST has been developed to be maintenance friendly, for example, the seals of both the propeller shaft and the steering mechanism can be replaced without de-assembling the thruster.

The Wärtsilä WST is supplied with a detailed maintenance information document which clearly defines the maintenance task in easy steps for operators.

Wärtsilä can provide spare parts packages which are pre-defined according to the desired redundancy levels by the owner/operator along with the required technical support and field services.

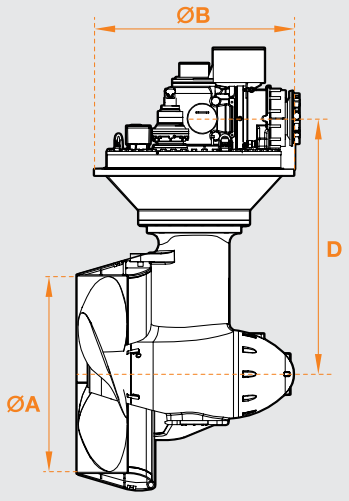
Wärtsilä can also offer customer friendly long term concepts to optimize the maintenance and operations of their installations, this allows the customers to focus on generating the maximum revenue from their operations, leaving behind their equipment worries to us. In combination with Wärtsilä PCMS (Propulsion Condition Monitoring Service), downtime and maintenance costs can be minimised.

We offer a worldwide service network that ensures reliable and efficient support, and the quickest possible solution to any problem, during the full operational lifetime of your equipment.

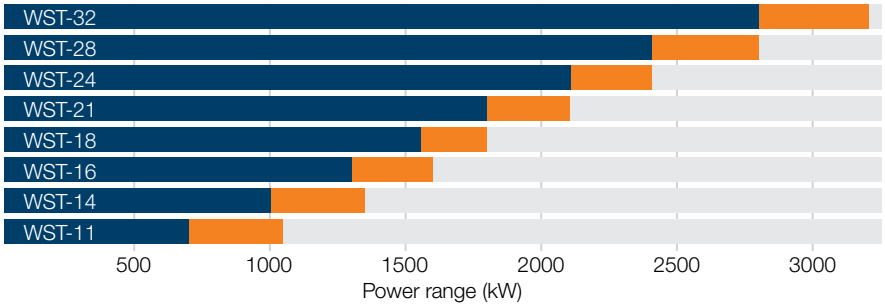
Our Services organization currently features more than 11,000 dedicated professionals in 70 countries. Wärtsilä adds value to your business at every stage in the lifecycle of your installation. With us as your service partner, you receive many measurable benefits such as availability and performance, productivity gains and cost benefits. Above all, peace of mind in the knowledge that your installation is being serviced by the most experienced partner you could have – Wärtsilä.

WST with slipping clutch and PTO for diesel-mechanical drive

WST with electrical steering for diesel-electric drive



Wärtsilä Steerable Thrusters range



Bollard Pull performance of Wärtsilä Steerable Thrusters

Thruster type	Engine power (2) (kW)	Input speed (rpm)	Propeller diameter (mm)	Bollard pull (1) (tonnes)
WST-11	900	750 1000 1200 1600 1800	1600	30
	1050		1800	36
WST-14	1150		1800	39
	1275		1900	43
	1350		2000	46
WST-16	1400		2000	47
	1600		2200	55
WST-18	1700		2200	57
	1800		2400	63
WST-21	2050		2400	69
	2100		2600	73
WST-24	2400		2600	80
	2400		2800	84
WST-28	2800	720 1000 1200	2800	94
	2800		3000	97
WST-32	3200		3000	107
	3200		3200	111

1) Based on two thrusters, 100% power, FP propeller with pitch and nozzle designed for bollard pull and including thrust deduction.
2) In case of ice class notation, maximum power level is reduced.

Wärtsilä Steerable Thrusters dimensions (mm)

Thruster Type	Dimensions					Weight[1] (kg)
		Weld-in	Bolt-in	PAL options D (mm)		
	A (mm)	ØB (mm) (well diameter (mm))				
WST-11	1600	1942 (2000)	1948 (2000)	2400	2700	10000/11800
	1800					
WST-14	1800	1942 (2000)	1948 (2000)	2500	2800	10900/12860
	1900					
	2000					
WST-16	2000	2342 (2400)	2326 (2400)	2800	3150	17050/20400
	2200					
WST-18	2200	2342 (2400)	2326 (2400)	2900	3250	18600/21950
	2400					
WST-21	2400	2542 (2600)	2512 (2600)	3200	3500	24800/27500
	2600					
WST-24	2600	2692 (2750)	2660 (2750)	3500	3800	28500/31500
	2800					
WST-28	2800	2862 (2920)	2825 (2920)	3900	4200	32800/36100
	3000					
WST-32	3000	3042 (3100)	3000 (3100)	4000	4500	37000/41000
	3200					

1) Estimated minimum (FPP and smallest prop / nozzle / propeller arm length (PAL)) and maximum (CPP and biggest prop / nozzle / PAL) weights

These tables only address the Wärtsilä Steerable Thrusters up to 3200 kW.
For other power ratings, please contact www.wartsila.com or your nearest Wärtsilä sales office.

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www.wartsila.com

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