

VOITH

Exactly on Course.
Range of Marine
Products and Services





The Right Propulsion System for Every Situation.

Be it out at sea or in port, on rivers or lakes: Voith's custom-tailored propulsion systems ensure precise, prompt and safe maneuvering. Our propulsion solutions are specifically designed for all maritime tasks and requirements.

Propulsion system technology is key to operate vessels efficiently and with a high degree of safety. Matching the propulsion system to the vessel design is equally important. With 90 years of experience, Voith provides both: Propulsion systems tailored to the application in question and vessel concepts.

In addition to the proven Voith Schneider Propeller (VSP) with its stepless, precise and prompt generation of thrust in all directions, the Voith Inline Thrusters (VIT) and Voith Inline Propulsors (VIP) are used as propulsion systems or thrusters. The Voith Linear Jet (VLJ) combines the best properties of propellers with the best properties of waterjets. Voith offers a customized service package accompanying the customer throughout the entire product lifecycle.

Our Target Applications: Offshore, Tugs, Ferries, Navy, Yachts, Cruise

	Voith Schneider Propeller	Voith Inline Thruster/ Propulsor	Voith Linear Jet	Voith Electronic Control
Offshore	•	•	•	•
Tugs	•	•		•
Ferries	•	•	•	•
Navy	•	•	•	•
Yachts	•	•	•	•
Cruise		•		•



Voith Schneider Propeller

Propulsion and steering – ahead, astern and sideways: The Voith Schneider Propeller (VSP) developed 90 years ago generates thrust in all directions. Propulsion and steering are combined in one unit, thus allowing prompt, safe and precise maneuvering, even under adverse conditions. An additional feature: Voith Roll Stabilization (VRS)



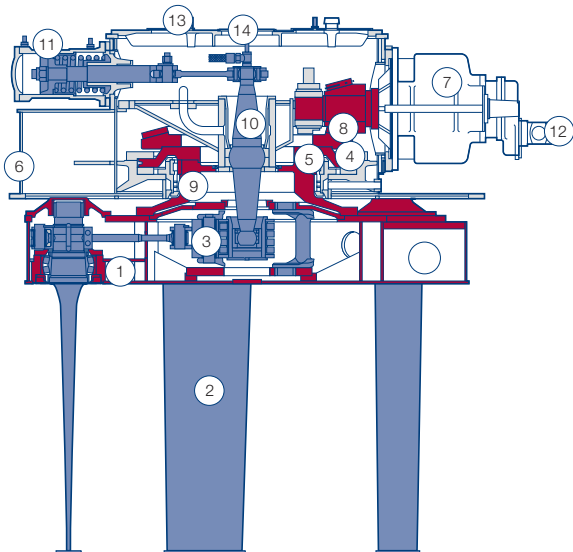
Voith Schneider Propeller

Successful worldwide

The VSP is suitable for a wide range of applications – from harbor tugs to offshore supply vessels. And it has been operating successfully in all these applications for decades. The VSP is distinguished by its high reliability and low maintenance requirements. Its low fuel consumption translates into minimum power requirements while at the same time maximizing safety for the vessel and the environment.

The VSP principle is strikingly simple and fascinating at the same time: A rotor casing fitted with four, five or six propeller blades rotates about a vertical axis. As is the case with the tail fin of a dolphin, a superimposed oscillating motion of the blades around their own axis generates thrust. The magnitude of thrust is determined by the rotational speed of the rotor casing; The blade angle determines the direction of thrust.

Longitudinal section of a VSP



- | | | | |
|----------------|--------------------|------------------|--------------------|
| 1 Rotor casing | 5 Roller bearing | 9 Driving sleeve | 13 Control shaft |
| 2 Blade | 6 Propellerhousing | 10 Control rod | 14 Indicator plate |
| 3 Kinematics | 7 Reduction gear | 11 Servomotor | ■ rotating parts |
| 4 Thrust plate | 8 Bevel gear | 12 Gear pump | ■ steering parts |

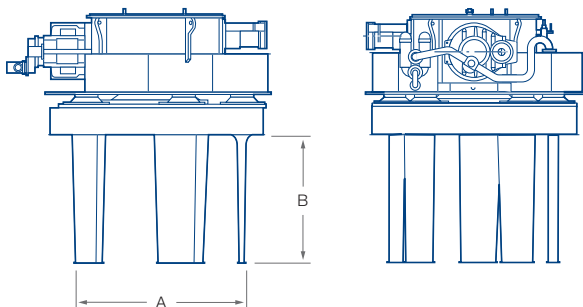
VSP sizes

Propeller type/size	Blade orbit diameter A [mm]	Blade length B** [mm]	Number of blades
12R4 EC/90-1	1 200	9 12	4
16R5 EC/120-1	1 600	1 215	5
18R5 EC/150-1	1 800	1 512	5
21R5/150-2	2 100	1 516	5
26R5/195-2	2 600	1 965	5
28R5/210-2 28R5/210-2 AE50	2 800	2 115	5
28R5/234-2	2 800	2 355	5
28R5 ECS/234-2	2 800	2 355	5
30R5/265-2	3 000	2 666	5
31X5 (EC, ECS)/265-1	3 100	2 666	5
32R (V) 5/265-2	3 100	2 666	5
32R (V) 5 EC/265-2	3 200	2 666	5
32R (V) 5 ECS/265-2	3 200	2 666	5
36R6/265-2	3 600	2 672	6
36R (V) 6 ECS/285-2	3 600	2 872	6

* Possible engine speed 720 - 1 800 rpm

** Max. blade length

EC/ECS = Propeller with electronic control system



Weight without oil	Oil filling	Max. propeller input power	Propeller input speed
[abt. kg]	[abt. l]	[kW]	[abt. rpm]
3 800	380	260	1000
6 700	680	540	670
9 500	1 000	780	570
16 000	1 600	1 000	700–1700
27 500	2 700	1 500	720–1200
33 000 34 500	3 200	1 900	720–1200 1200–1600
36 000	3 700	2 000	720–1200
38 500	4 300	2 000	720–1600
47 000	4 000	2 450	720–1200
50 000	4 200	2 500	280*
50 000	4 200	2 500	280*
54 000	5 200	2 600	720–1200
54 000	5 200	2 600	720–1 200
76 000	7 500	3 400	700–1 050
88 000	8 500	3 900	700–1 200

Voith Inline Thruster and Voith Inline Propulsor

Minimum vibration and noise emission, prompt steering response and efficient thrust generation – these were the targets set by Voith for the development of a new propulsion system. The results are the Voith Inline Thruster (VIT) and Voith Inline Propulsor (VIP) Rim drive systems. The VIT is the ideal transverse thruster for use in the bow or stern. It significantly improves the vessel's maneuvering. Together with a steerable nozzle, the VIP SO AZI is designed for swing-out and rotation capability through 360°.

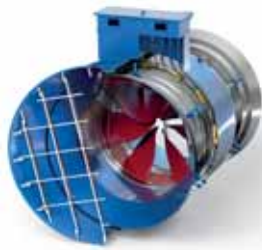
Prompt, efficient, silent

VIT and VIP require neither axes nor shafts or gearing. The propeller blades made of carbon-fiber-reinforced polymer (CFRP) are attached to the inner side of the motor. The motor transfers a large torque without transmission losses. The unit is cooled by seawater, i.e. an additional cooling system is not required. Thanks to the sea-water-lubricated radial and axial bearings, the motor is completely maintenance-free.

With an optional swing-out unit, the VIT-SO can be extended from the vessel hull when needed. In addition the VIT-SO AZI can rotate through 360° in their end position.



Voith Inline Thruster (VIT)



VIT cut model

VIPs and VITs can either be used as auxiliary propulsion systems or transverse thrusters. Voith can offer the entire system: tunnel, grids, flowparts and the power and control electronics incl. frequency converter.

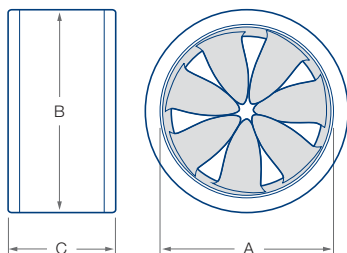
Product range Voith Inline Thruster (VIT)

Type	Power [kW]	Propeller diameter A [mm]	Outer diameter B [mm]	Width* C [mm]	Weight* [kg]
VIT 380-50	50	380	560	280	165
VIT 550-110	110	550	790	355	400
VIT 550-110 SO	110	550	790	355	400
VIT 850-200	200	850	1 120	420	910
VIT 1000-300	300	1 000	1 380	530	1 970
VIT 1350-500	500	1 350	1 750	650	4 300

Product range Voith Inline Propulsor (VIP)

Type	Power [kW]	Propeller diameter A [mm]	Outer diameter B [mm]	Width* inc. nozzle C [mm]	Weight* [kg]
VIP 850-200 SO AZI	200	850	1 170	760	1 100
VIP 1000-300 SO AZI	300	1 000	1 440	940	2 200
VIP 1350-500 SO AZI	500	1 350	1 810	1 200	3 500

* Thruster only



Voith Inline Thruster and Voith Inline Propulsor for Offshore Applications

The VIT significantly improves vessel comfort and provides increased thruster performance.

Be it Dynamic Positioning (DP) or harbor maneuver – the VIT is the right choice.

The swing-out fully azimuthing Voith Inline Propulsor (VIP) combined with a nozzle, is designed as a main propulsor or assist system for DP or tracking modes, while providing the highest comfort class criteria.

Efficient, silent and compact

The VIT, as well as the VIP, for offshore applications, operates with a central roller bearing system. The system features a well-proven design and material combination. The bearings are equipped with a leakage-free and redundant sealing system.

The fixed-pitch thruster blades of the propeller are made from bronze, are highly resistant to cavitation and suitable for ice-class. The propeller is directly connected to the rotor housings. The unique design of the VIT/VIP results in significantly reduced noise and vibration emissions.



A positioning of accommodation areas near the thruster area is possible without any major provisions concerning insulation. The VIT/VIP is not significantly stressed when the propeller ventilates.

Voith Inline Thruster (VIT)

The Voith scope of supply includes the entire system: tunnel, grids, flow parts, and power- and control electronics. Voith is the system supplier – your single point of contact.

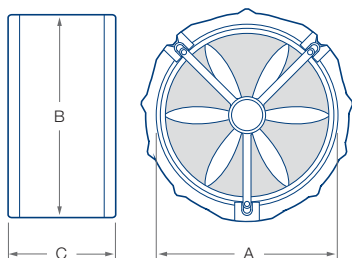
Product range Voith Inline Thruster (VIT) Offshore

Type	Power [kW]	Propeller diameter	Outer diameter	Width	Weight*
		A [mm]	B [mm]	C [mm]	[kg]
VIT 1350-500 H	500	1350	1800	1150	5100
VIT 1650-750 H	750	1650	2230	1350	8200
VIT 2000-1000 H	1000	2000	2520	1490	10700
VIT 2300-1500 H	1500	2300	2850	1670	12300

Product range Voith Inline Propulsor (VIP) Offshore

Type	Power [kW]	Propeller diameter	Outer diameter	Width* inc. nozzle	Weight*
		A [mm]	B [mm]	C [mm]	[kg]
VIP 1350-500 H SO AZI	500	1350	1800	1250	5500
VIP 1650-750 H SO AZI	750	1650	2360	1550	8600
VIP 2000-1000 H SO AZI	1000	2000	2580	1800	11200
VIP 2300-1500 H SO AZI	1500	2300	2880	2000	13000

* Thruster only



Voith Linear Jet

The Voith Linear Jet (VLJ) combines the best properties of propellers with the best properties of waterjets. Low installation complexity, low sensitivity to marine growth, sustained high efficiency across the vessel's speed range and high bollard pull are taken from the propeller side. Reduced vessel draft, the ability to reach high speeds with high efficiency and low noise and vibration levels are taken from the waterjet side.

Applications

- Crew transfer vessels
- Yachts
- (Semi)-fast ferries
- Defense applications

Product features

- Good high-speed and low-speed efficiency
- Low noise & vibrations
- Low maintenance machine
- Low marine growth sensitivity
- Reduced draft

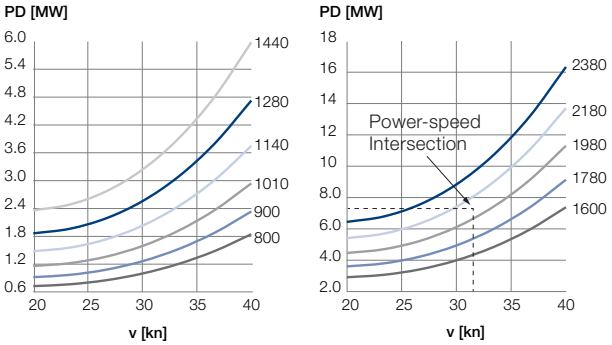
A new propulsion standard

The Voith Linear Jet is suited for almost all ships with a top speed of 40 knots or less. Especially ships that combine a high top speed requirement with frequent low speed cruising will benefit from substantial fuel savings and an increased range at sea. Typical examples of ships with such an operation profile between low and high speed are coastal patrol vessels, ferries with seasonal operation profiles or yachts combining low-speed cruising with high-speed transit.



Driveline of the Voith Linear Jet

Rotor relations VLJ



The above graphs indicate the VLJ size required based on the relation between the engine power and the design speed of the vessel. For instance a ship with two 7 000 kW engines and a corresponding design speed of approx. 32 knots will need two VLJ2180's. The correct VLJ size is thus indicated by the line above the intersection of the engine power and the design speed (see example in above graph).

Please contact us for an accurate selection custom for your project. Special operational conditions like bollard pull, towing conditions or extreme low noise profiles for defense applications are not considered in above graphs and may give size selection deviations.



Voith Control System

Years of excellence: Voith propulsion systems are in use all over the world and in all kinds of vessels. And for each individual propulsion system, Voith offers a perfectly matched control system – electronic or mechanical.



Electronic control system

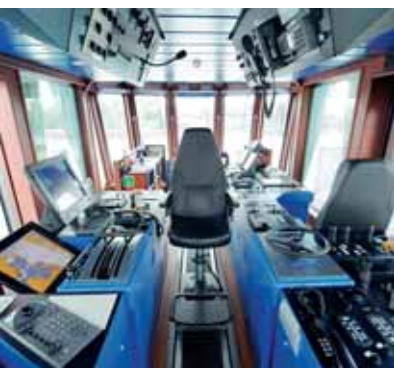
Voith offers an electronic control system consisting of a modular hardware and software architecture with a wide variety of control functions and standardized interfaces.

Fast actuation and exact propulsion system control, remote diagnostics via the internet and human-engineered control elements are but some of the advantages of this system.

Mechanical control system

Absolutely reliable, straight forward to use and easy to maintain – attributes that have made the Voith mechanical control system stand out for many decades. It is primarily used in applications with a very short distance between the wheelhouse and the propulsion unit, as is the case on Voith Water Tractors.

Additional electronic features, such as an autopilot, can be integrated via actuators. In addition, various optional components such as auxiliary servomotors are available for increased ease of handling.



Global Service

Partnership throughout the entire life of the product. Voith offers a customized service accompanying the customer throughout the entire product lifecycle. Benefitting from 89 years of marine experience, Voith customers are in good hands – Both before and after the purchase. Short repair and maintenance times along with efficient operation – thanks to the customized Voith Service.

In addition to providing innovative service solutions and product support, Voith offers personalized training courses to ensure optimum professional training of the operating personnel. The focus is always on customer satisfaction, efficient operation of the Voith product, and on short repair and maintenance times. Vessels equipped with Voith technology are in use all over the world.

To ensure optimum service and minimize response time, Voith has set up a global service network. Experienced service technicians provide support during installation, commissioning, and during maintenance and upgrade work. Spare parts availability is a matter of course to Voith and is ensured long-term for all products.



Service packages

Voith provides innovative service solutions and product support:

Field service

Short repair and maintenance times along with efficient operation – thanks to the customized Voith Service network.

Spare Parts – High availability and reliability

Efficient operation of the Voith components throughout their entire lifetime is paramount. The Voith spare parts management is characterized by high availability and reliability.

Remote data access

For the electronic control system Voith can offer a remote data access which allows an access on the electronic control system from any place without sending a service technician instantaneously.

Condition Monitoring System (CMS)

Optionally Voith can offer a Condition Monitoring System for all products, which should avoid failures of components and will provide input to Voith's condition based maintenance services.

Retrofit of electronic control systems and general modernization

Health checks



Emergency Hotlines

North and South America

Voith Turbo Inc.
25 Winship Road
17406-8419 York (PA)
USA

Emergency Hotline

+1 888 244 2882

Europe, Middle East, Africa

Voith Turbo
GmbH & Co. KG
Alexanderstrasse 2
89522 Heidenheim, Germany

Emergency Hotline

+49 173 3091 918

Asia, Pacific

Voith Turbo Pte. Ltd.
10 Jalan Lam Huat,
Voith Building
737923 Singapore

Emergency Hotline

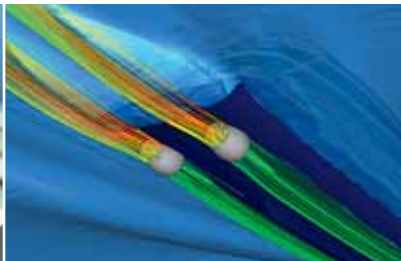
+65 6863 0073

Customized Support

Voith offers comprehensive support in developing new vessel concepts and solving technically complex issues. Being able to safely forecast vessel behavior through comprehensive CFD calculations, simulator studies and FE structural analyses ensures further investment security for our customers. Model measurements in our own test tank or at renowned international research institutes and large-scale measurements are carried out regularly and to a high quality level by Voith.

The Voith customer support stands apart due to its comprehensive approach: With its tools, highly motivated and skilled development engineers, powerful hardware and software and many decades of experience, Voith examines not only the vessel propulsion systems but the entire vessel and is capable of carrying out all calculations, simulations and measurements required.

- Simulator studies / simulator training
- Nautical training
- Technical training
- Model tests at own test tank
- Assistance at model tests
- CFD studies
- Basic layouts of vessel concepts, as generated arrangements, lines plans, installation proposals
- Bollard pull and speed prognosis
- Escort force calculations
- DP calculations





Siem Moxie

- Windpark Infield Support Vessel for Siem Offshore, Kristiansand, Norway
- LxBxD: 74.00x 17.00x 6.40 m
- Engine power: 2 x 1850 kW
- Propeller type: 28R5 ECS/234-2

Lochinvar

- Double-ended Ferry for Caledonian Mac Brayne, Great Britain
- LxBxD: 42.80x 12.20x 1.73 m
- Engine power: 2 x 375 kW
- Propeller type: 16R5 EC/90-1



Shinano Mar

- Escort Voith Water Tractor for Fukushima Kisen, Co., Japan
- LxBxD: 39.00x 13.60x 6.15 m
- Engine power: 2 x 2 650 kW
- Propeller type: 32R5 ECS/265-2

Trearddur Bay

- Crew Transfer Vessel for Turbine Transfers, UK
- LxBxD: 20.00x 7.00x 1.30 m
- Engine power: 2 x 900 kW
- Propeller type: VLJ 900



Sea Installer

- Self-propelled Jack-Up Vessel for A2SEA A/S, Denmark
- LxBxD: 132.00x39.00x5.30 m
- Engine power: 3 x 3 800 kW for VSP
+ 1 x 1 500 kW for VIT
- Propeller type: 36R6 ECR/285-2 + 1x 2 300-1 500

Lady Kathryn

- Yacht Lady Kathryn V
- Top speed: 15.5 knots
- Length: 61 m
- Propeller type: Voith Inline Thruster type 850-160



Kroonborg Wagenborg

- Maintenance Support Vessel (MSV), Walk to Work (W2W)
- LxBxD: 79.20x16.00x5.00/5.40 m
- Engine power: 2x 1 850 kW @ 1 200 rpm for VSP
+ 2x 1 000 kW for VIT
- Propeller type: 28R5 ECS/234-2 + 2 000-1 000 H

Amrumbank

- Buoy Layer for Wasser- und Schifffahrtsamt Tönning, Germany
- LxBxD: 44.50x10.50x1.76 m
- Engine power: 2x 375 kW
- Propeller type: Voith Schneider Propeller 16R5 EC/120-1

Voith Turbo GmbH & Co. KG
Alexanderstr. 2
89522 Heidenheim, Germany
Tel. +49 7321 37-2055
Fax +49 7321 37-7105
marine@voith.com
www.voith.com/marine

VOITH
Engineered Reliability