VERHAAR OMEGA

V-POD
Z-DRIVE

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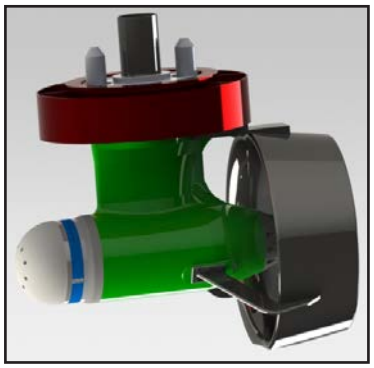
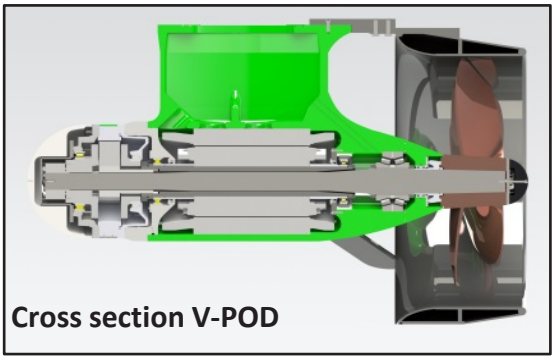
V-POD® electric propulsion & maneuvering system

The Verhaar Omega V-POD®, is one of the first electric driven propulsion systems in which an ideal balance has been achieved between economical, technical and ecological aspects.

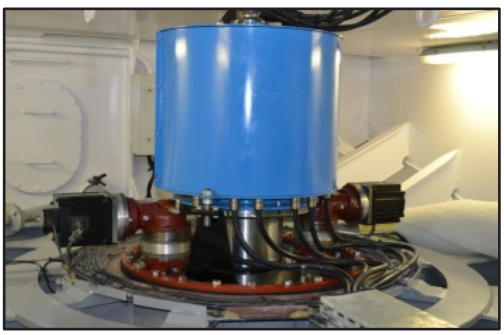
The V-POD houses an electric motor that has been outfitted with a hollow drive shaft. This hollow shaft drives the sun-wheel of a planetary gearbox that has been connected to the outer end of the propeller shaft. Due to the reduction ratio of the planetary gearbox, the propeller runs at the most economical speed resulting in the best performance with regard to efficiency and thrust. De V-POD has amply proved itself and can be applied to almost any kind of vessel.
The V-POD can furthermore be used in combination with a diesel- as well as in combination with a LNG-generator set.





Cross section V-POD

V-POD and designers
Its unique and compact design enables ship designers to achieve a more flexible and more functional ship design.
Since the V-POD does not take up much space inside the vessel, the engine room can become much smaller.
Another advantage is that the generator set can be placed far away from the ship's accommodation resulting in more comfort for the crew.



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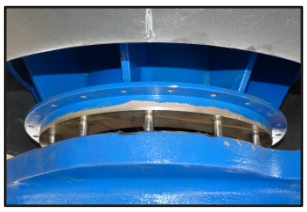
V-POD and shipyard

The V-POD is attractively priced and can be installed quickly and easily. Apart from saving oceans of time it also contributes to reduce the labour cost.

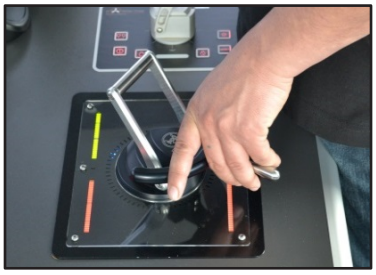


V-POD en end-user

The acquisition of a V-POD offers the end-user many advantages, such as:

- User friendly (easy to operate).
- Outstanding reaction rate which benefits the manoeuvring- and braking capabilities
- High efficiency at low power consumption (at partial load)
- Reduced maintenance cost due to less generator running hours
- Less fuel consumption
- Reduction of emissions (CO2, NOx en SOx)

V-POD applications

* Supply Vessels;
* Push boats
* Inland Vessels;
* Self Propelled Barges;
* i.e. basically every Diesel-Electric or LNG-Electric propulsed vessel

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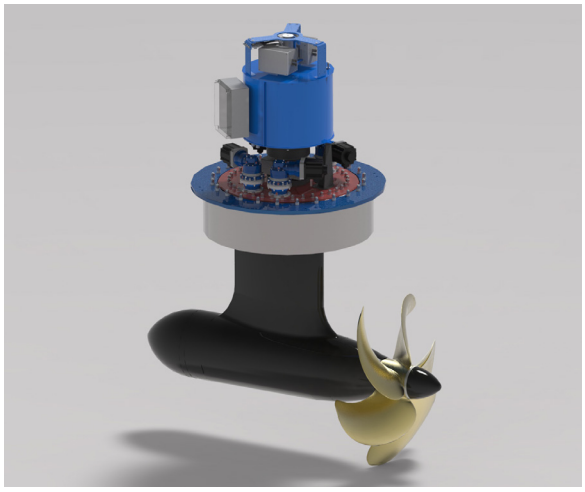
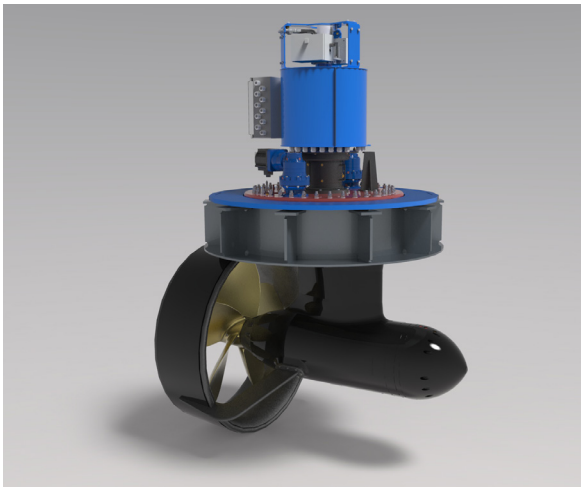
V-POD characteristics

- High maneuverability
- Compact and efficient: through internal gears higher E-motor rpm and therefore a smaller motor size (=cheaper), combined with lower prop rpm (=higher efficiency)
- Excellent braking / stopping characteristics
- Easy installation, no alignment
- Available in push & pull execution
- Minimum of maintenance
- Robust electric drive of prop without 90° gear boxes
- Improved steering characteristics: full propulsion, can rotate 360°





- Available in Push & Pull execution

Model	Max. Power [kW]	Max. Torque Prop. Shaft [Nm]	Weight excl. nozzle [kg]
600	500	11052	5755
670	1000	26898	7650
760	1500	45327	11250
850	2000	70212	14835
960	2500	106098	17425

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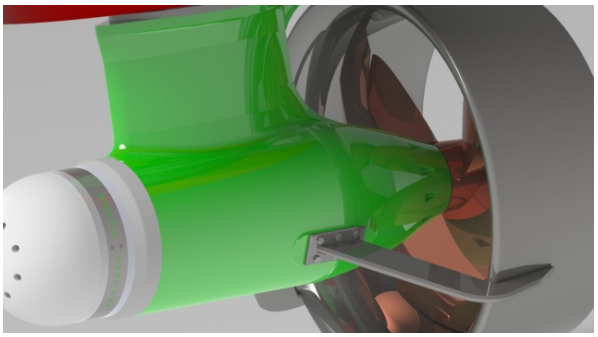

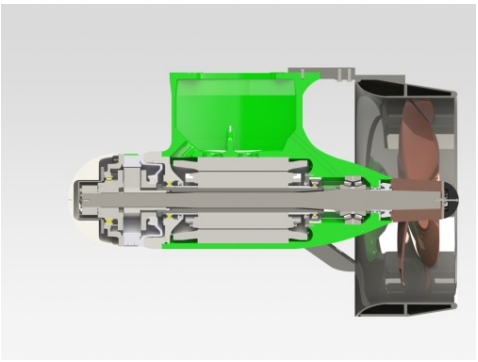

V-POD® advantages

Main advantages of the Verhaar-Omega V-POD compared to a Z-drive or other rudder propellers:

a. The motor of the V-POD is mounted inside the underwater housing and therefore a V-POD is much more space saving than other drives: other drives still require an additional electric or diesel motor in the engine room.

b. The weight of the V-POD INCLUDING electric motor is low. For example: a 1200kW V-POD weighs 14 Tonnes. A rudder propeller propeller of another brand with the same power already weighs about 17 Tonnes and the weight of a motor still has to be added(!).

c. The V-POD only has one gear box, whereas a Z-drive has two. Important, if you realize that every gear box causes about 3% less efficiency.

d. The V-POD has a long horizontal shaft, with bearings at each end. Forces will be better handled by the V-POD than thruster units which have a shorter shaft. So, the V-POD has less stress on the shaft, gears & bearings.

e. The V-POD unit rotates by means of electric motors – most other rudder propellers rotate hydraulically. This means they need an hydraulic power unit, with the risk of oil leakage.

f. The oil content of a 1200kW V-Pod is 50 liter in total. The oil content of a another rudder propeller with the same power is approximately 1500 liter.

g. The propeller can rotate clockwise and counter-clockwise. This means that if you want to go backwards with the vessel, you only have to change the rotation of the propeller. In order to do the same, a Z-drive first has to rotate the complete thruster unit 180 degrees.

h. Hardly any vibrations, due to its built-in electric motor and having only one transmission

i. The Verhaar Omega V-POD counters the disadvantages of high price and low efficiency of the existing POD drives that are using larger oversized electric motors. This has been realized by integrating a planetary gear reduction enabling us to reduce the size and consequently the cost price of the electric motor significantly. Moreover, the integrated planetary reduction gear guarantees a low propeller speed with a high thrust efficiency.

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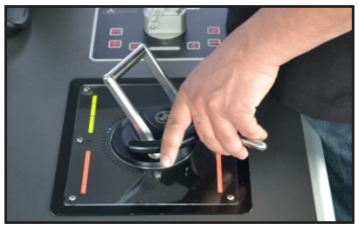
V-POD SYSTEM OVERVIEW

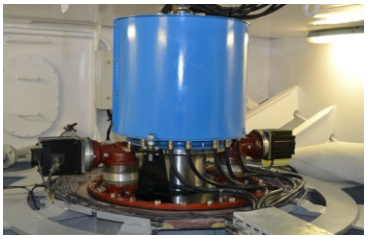




Control system

Freq.drive

Generator set

Oil pump set



∞360° slip ring system


V-POD® Azimuth Propulsion Thruster

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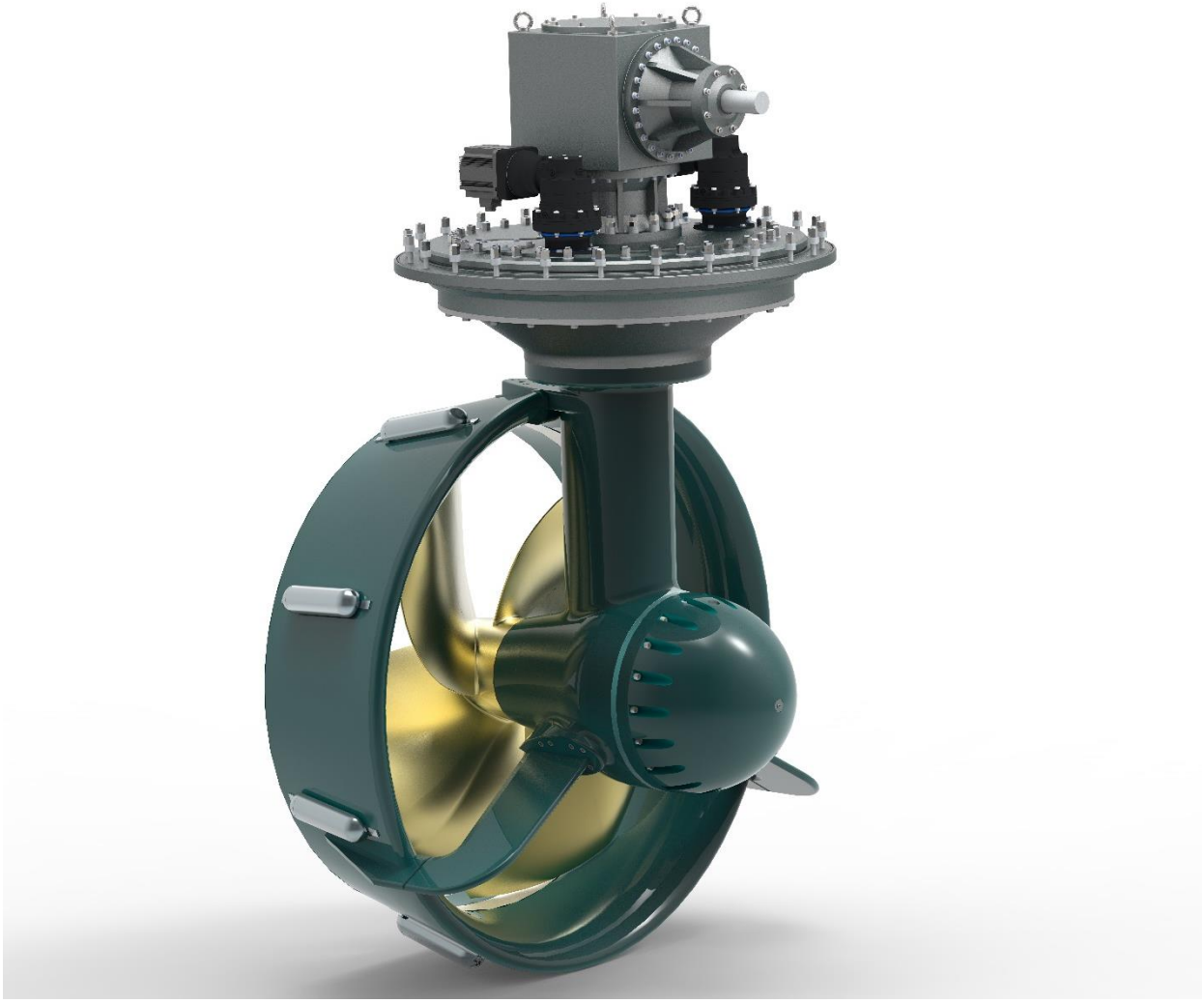
NEW !!



Power range : 400kW – 2400kW

Features of this new range:

- Highly efficient spiral bevel gears;
- Low built-in height for the upper gearbox;
- Individual lubrication of upper & lower gearbox;
- Low friction, highest quality bearings;
- Electric steering through servo motors;
- Streamlined underwater gearbox housing for wake reducing effects;
- High-efficient nozzle and propeller combination for maximum bollard pull and speed performance;
- Easy, hydraulic (dis)mount of the propeller;
- Environmental friendly shaft sealing with leakage detection;
- Ready for all classification societies.

Thruster Model	Max. input power [kW] / [hp]	Input speed [rpm]	Propeller Diam. [mm]
OZD 120	548 / 734	1500-1800	1200-1450
OZD 160	895 / 1200	1500-1800	1650-1800
OZD 190	1345 / 1804	1500-1800	1750-2000
OZD 220	1715 / 2300	750-1800	2100-2250
OZD 250	2400 / 3218	750-1800	2600-2800

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DELIVERY PROGRAM

Manoeuvring Equipment

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Product:	**Channel Thruster**
Model:	2, 3 or 4 channel execution
Range:	220 - 955 kW
Possible drive:	electric, hydraulic or diesel

Product:	**Steering grid**
Model:	VBS
Range:	103 - 662 kW
Possible drive:	electric, hydraulic or diesel

Product:	**Transverse Tunnel Thruster**	
Model:	Fixed Pitch Propeller type OFP	Controllable Pitch Propeller type OCP
Range:	25 - 1100 kW	300 - 1100 kW
Possible drive:	electric, hydraulic or diesel	electric, hydraulic or diesel

Product:	**V-Pod propulsion and manoeuvring system**
Model:	600 / 670 / 760 / 850 / 960
Range:	330 - 2500 kW
Possible drive:	incorporated e-motor

Product:	NEW !! **Z-drive propulsion**
Model:	OZD 120 / 160 / 190 / 220 / 250
Range:	400 - 2400 kW

Marine Air & Nitrogen systems

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Product:	**Nitrogen Generator**
Min/max Purity:	95%
Range:	15 - 5500 nm^3/h

Product:	**High-Purity Nitrogen Generator**
Min/max Purity:	up to 99.5%
Range:	15 - 1300 nm^3/h

Product:	**Compressed Air Systems**
Model:	Starting air compressors, Working air compressors
Range:	Customized Air Systems & off-the-shelve Atlas-Copco compressors

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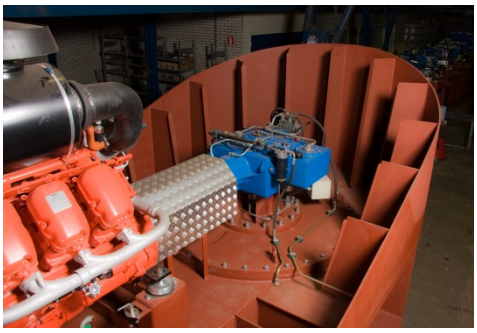
Channel Thruster

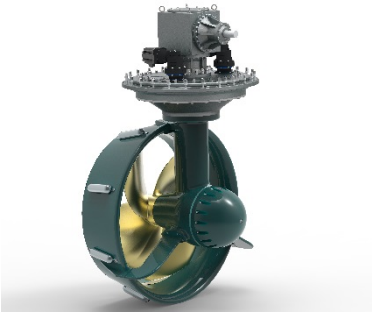


Steering Grid

Transverse Thrusters:
- Fixed Pitch Propeller
- Controllable Pitch Propeller

V-POD propulsion system

Z-DRIVE propulsion system



Marine Air Compressors & Nitrogen Systems

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