BRUNVOLL
PRECISION IS OUR PASSION

Contra Rotating Propulsion System

Shaft in shaft propulsion system

> *"Potential savings of CRP are assessed to be in the order of 6–20% of the power consumption with an average of 13%, although higher figures may be presented by industry for specific case"*
>
> *Source: European Commission - ECOFYS*
> *Study on energy efficient technologies for ships*

Contra Rotating Propellers (CRP) A unique combination of known technologies

A complete propulsion system with Contra Rotating Propellers in a redundant single screw configuration, class approved for two electric motors.

It is a configuration with fixed pitch propellers individually driven through a unique shaft-in-shaft system. Each propeller rotates independently, allowing for optimal efficiency.

The CRP propulsion system recovers part of the slipstream rotational energy, which is lost with single propeller configurations, and thereby enhances the hydrodynamical efficiency.

Better redundancy in a CRP system than traditional single propeller.

Normally, improved noise performance compared to single screw propeller with same propeller diameter due to lighter load on propellers.

Reduced emissions of CO2, NOx and SOx due to higher fuel efficiency.

The CRP system can be driven by any type of electric motors.

Brunvoll CRP may also be optionally configured for other extensive prime mover solutions, such as a combination of electric motors and any kind of combustion engines with or without shaft generators.

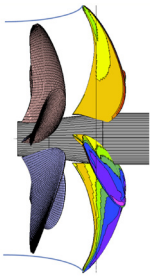
CRP Product Range 1,5 - 5,5 MW									
Total power (kW)	1500	2000	2500	3000	3500	4000	4500	5000	5500
Propeller dia. (m)	2,3	2,7	3	3,3	3,6	3,8	4	4,2	4,4

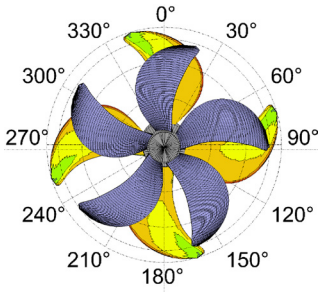
The Efficient CRP Propeller Design

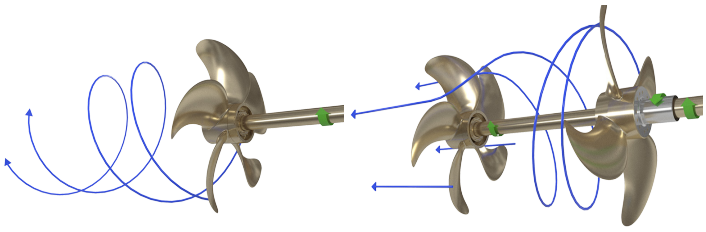
The aft propeller diameter is smaller in order to stay within the slipstream contraction from the forward propeller. The blade numbers of the two propellers are usually different to avoid vibrational problems, as they do not meet simultaneously.

Propeller blade designs are customised for the ship application, wake distribution and operating profile for optimum performance.

While a single propeller will induce a swirl in rotational direction in the slipstream behind the propeller, a CRP will recover the rotational energy and convert it into thrust.







CRP Shaft and Gearbox Arrangement

Outboard shaft seals complies with DNV Clean Design notation as standard.

Propeller thrust bearings are of robust Mitchell tilting pad type, integrated in the gearbox for easy inspection and maintenance.

Stern tube with oil lubricated white metal bearings.

Monitoring system for Contra Rotating Bearings.

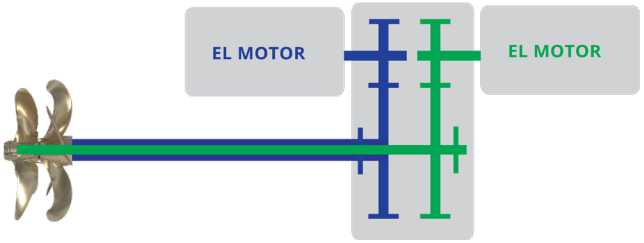
Low noise lubrication oil pumps driven by electrical motors.

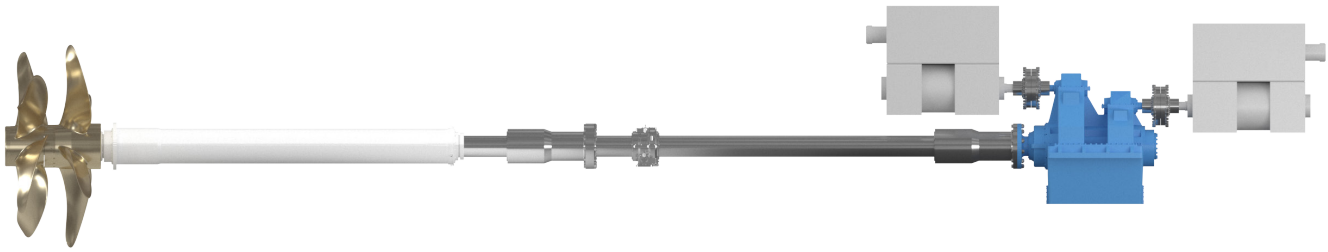
Oil purifiner in addition to oil filter system for gearbox as standard.

The gearbox is made of high quality cast iron. Final Element Analysis support the design and provide for optimum working conditions for gearwheels and bearings.

DIN 3961/73 6C26 as standard quality class on gear wheels. Main gear wheels according to DIN 3961/73 5C 26 for improved strength and lifetime is optional.

Journal white metal bearings for pinion and bull gear shafts are designed to ensure reliability during the gears' entire lifetime.





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