

At Berg Propulsion, the icy winds, and salty waves of the Swedish west coast have shaped our way of thinking.

Not a bad place to start, especially if you want to build safe and reliable propulsion solutions. Following these core values we have delivered over 6000 controllable pitch propellers for shipping and transport by sea since 1929.

A solid history is a good way to look forward.

And today Berg Propulsion is a group of international companies with committed people and local presence in all major markets, and headquarters of sales and marketing in Singapore.

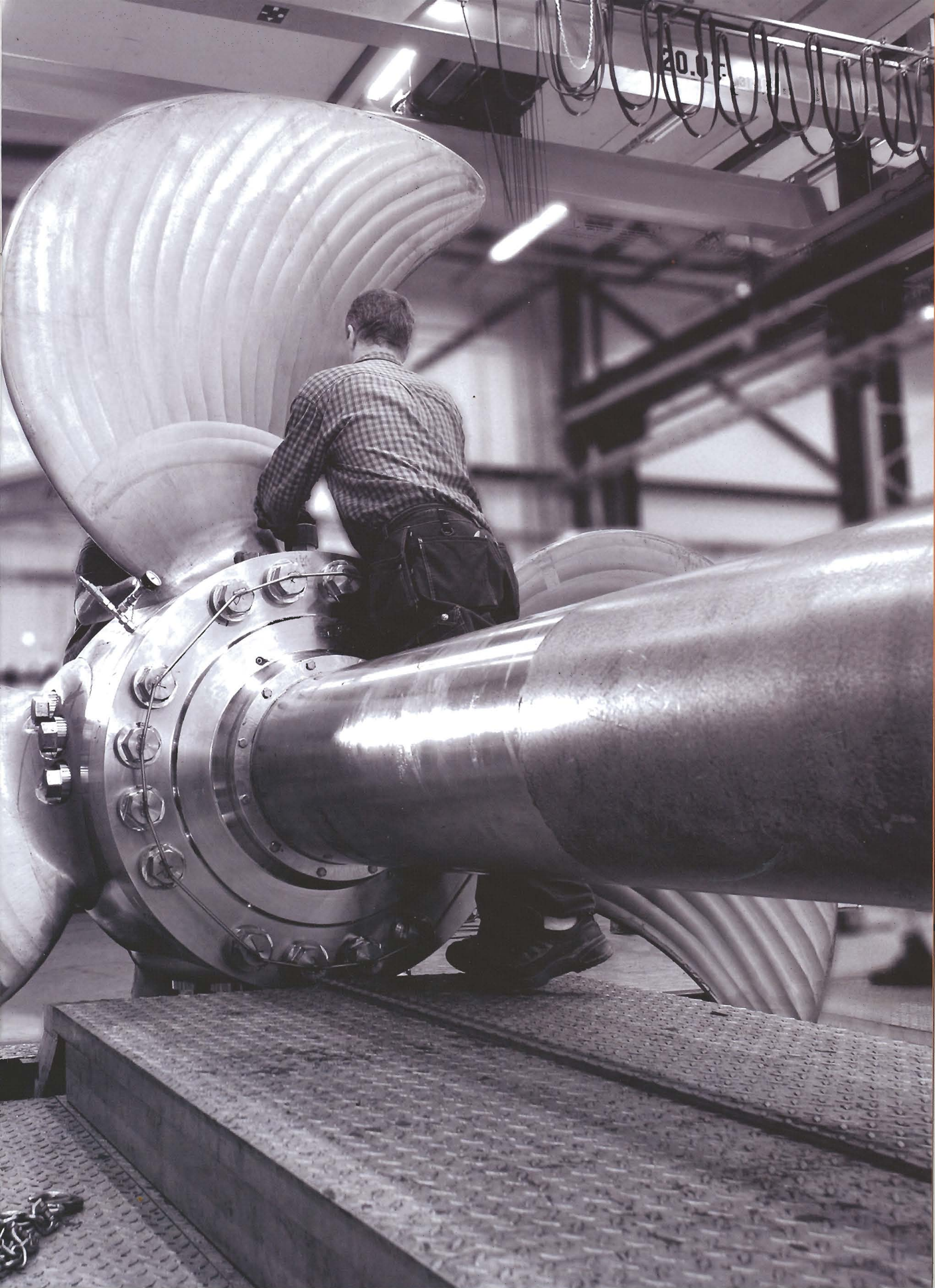
We will keep our end users' everyday life and environment in mind, to make sure that we understand their conditions. Not because it sounds good, but because it's the only way we know how to build a reliable future. A view of the world we like to sum up in our own saying:

At the Berg factory in Sweden the sea has been our neighbour for some 70 years. Winter, spring, summer and fall - day in, day out.

This experience has taught us respect for the natural force and mood swings of the open sea. Obviously this has shaped our way of working and core values, underlining the importance of building high quality propulsion that's as safe and reliable as possible. We've learnt to expect the unexpected.

**We spend more money on material,
so you can make more money on shipping.**

A vessel that moves makes money, a vessel that doesn't, takes money. Therefore we spend money where it is needed. This means less on company overhead and more on material for the vital parts of your propulsion solution. And higher quality propulsion means less downtime for you. To us, it's as simple as that.





**Call us conservative, even old-fashioned,
but it adds an extra dimension.**

We design optimized propellers in a conservative way, based on vast experience gained from almost one hundred years of quality thinking.

Optimizing the dimensions of the propulsion in a moderate way - with less stress in blade and hub material - means less downtime for your ship, and more profit for you as a ship-owner. A rather nice extra dimension, don't you think?

**At the Berg factory nature is our nearest neighbour.
And you should always be nice to your neighbour.**

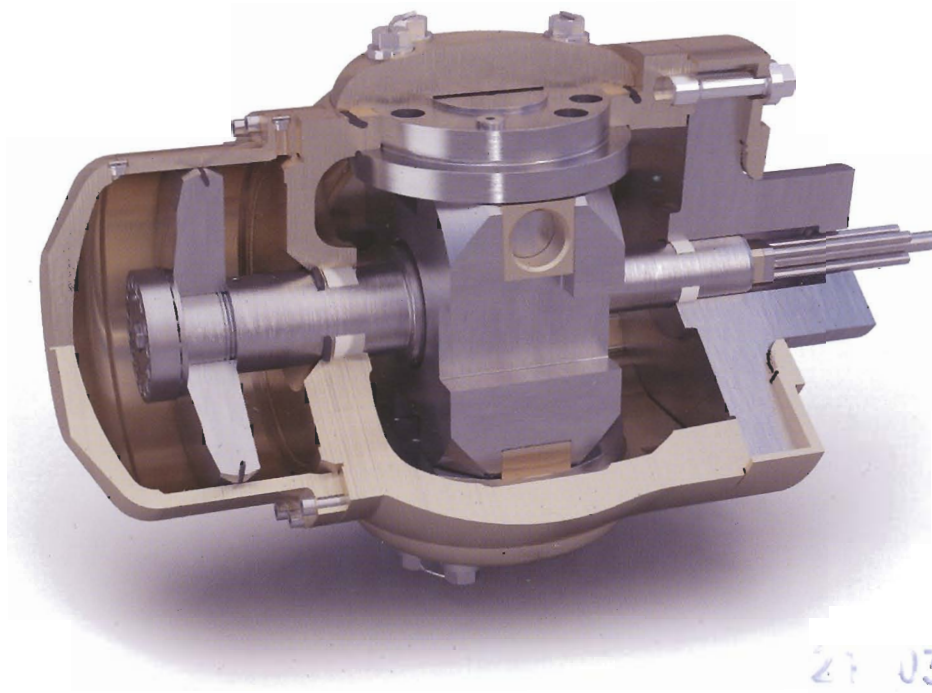
When it comes to the environment, we are committed to making our contribution. A good example is the new BCP Hub (see next page). By reporting possible leakages at an early stage, it prevents oil escaping into the sea.

This is just one of many examples, and the search for new improved ways to reduce environmental impact continues. After all, we want to keep our neighbour happy.

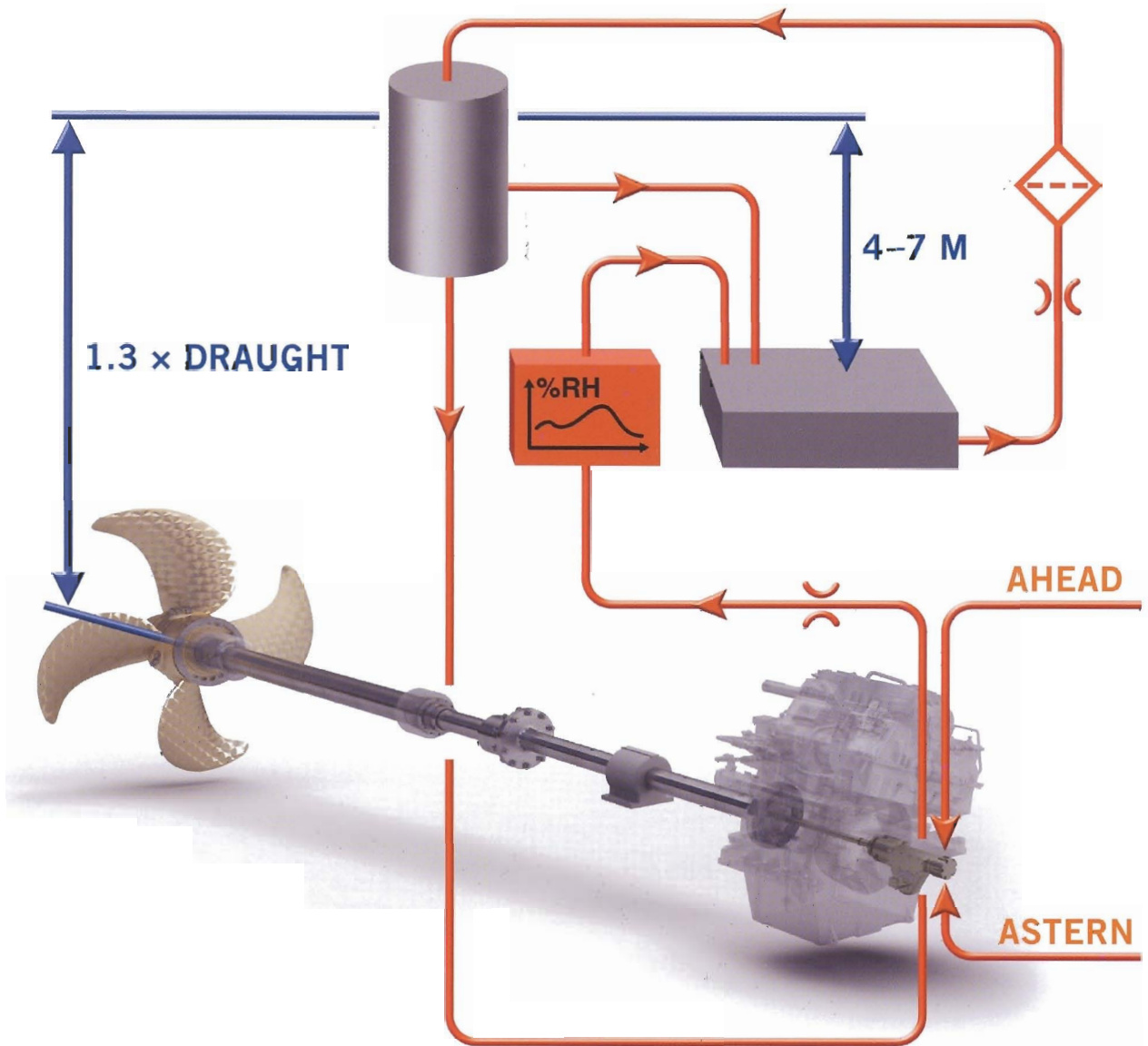
BCP Hub

- First in the world to check moisture content.

The new BCP is developed for heavy-duty applications with the pitch setting hydraulic servo cylinder in the hub. The hub lubrication system is a unique oil circulating system with an integrated moisture monitoring system. This is the first hub system in the world where the moisture content is constantly checked, making it possible to protect the entire propeller system as well as the environment.



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BCP Hub with feathering improves flexibility.

To improve flexibility for ships equipped with a twin propeller solution, Berg added the feathered features to the BCP hub.

In an emergency situation or a low speed condition, you can stop one of the propellers and put it into a feathered position. This way, the drag of the propeller is minimised. The result is a fuel saving and redundancy equal environment.

BCP Main characteristic:

- Heavy duty design with a well-proven blade seal system.
- Blade bearings with large surfaces mean low load and long life.
- Integrated hydraulic servo cylinder designed for low pressure, increasing the operational reliability.
- An optimized hub geometry and a robust dimensioning give increased strength and stiffness.
- Completely separated circulating oil lubrication system with continuous monitoring of the moisture content in the oil.
- Logging of the moisture content, which makes it possible to detect external damage and foresee the need for overhauling the hub.

BCP system advantages:

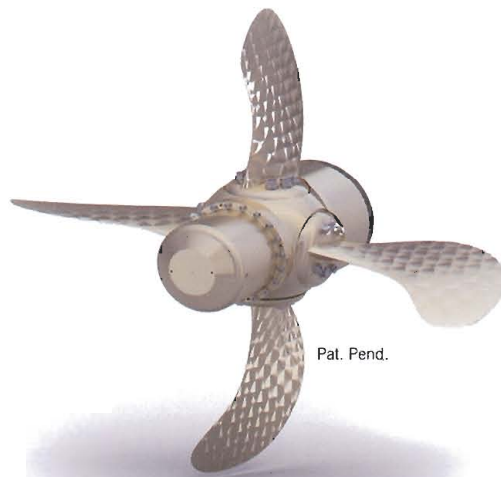
- Maximum reliability.
- Minimum downtime.
- Minimum maintenance.
- Minimum space requirement.
- Active control optimum oil condition by filtering.
- Continuous propeller hub condition monitoring.



BCP AHEAD.



BCP ASTERN.



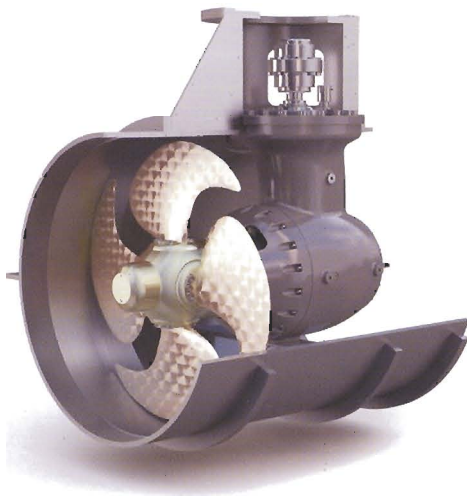
Pat. Pend.

FEATHERED.

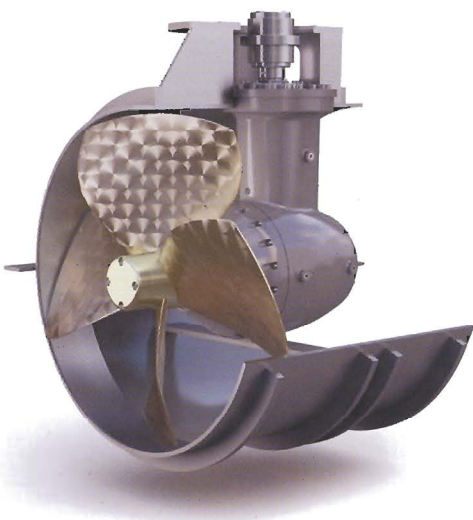
Thruster to trust.

The Berg Transverse Thruster system comes in two different modes - BTT & BFTT. BTT is a controllable pitch propeller type thruster normally used for constant shaft speed. BFTT is a fixed pitch propeller type thruster used when shaft speed is variable and reversible.

• The propeller unit with the gear housing can be removed from the tunnel when installed in your ship. This makes maintenance and service easier and less time-consuming.



BERG TRANSVERSE THRUSTER TYPE BTT.



BERG TRANSVERSE THRUSTER TYPE BFTT.

BAT - Berg Azimuth Thruster

The BAT is a steerable thruster together with a custom-made controllable or fixed pitch propeller. The thruster unit is available in both L-drive and Z-drive configurations. Our Azimuth Thruster has been designed to provide unparalleled flexibility and in-service performance. To maximize flexibility and ship efficiency the BAT is also available with feathering propeller.

When propelling the ship with a reduced number of propulsion units a feathered propeller will minimize the drag.

The BERG Azimuth Thruster has been designed to provide unparalleled flexibility and in-service performance

Core Properties

Meeting customer preferences has been key to the development of the BERG Azimuth Thruster (BAT). It is available with control or fixed pitch propellers, and in either Z- or L-drive configurations; it can be powered by any power source, and its turning system can be either electric or hydraulic. The blade and hub materials are either bronze or stainless steel.

Hydrodynamics

Berg Propulsion continues to focus on hydrodynamics in design, using modern tools such as CFD (Computational Fluid Dynamics) to optimize the hydrodynamic performance of products.

These tools are used to develop structures that achieve the lowest possible resistance and the highest possible functionality. One specific hydrodynamic project has resulted in the BERG Efficiency Nozzle (BEN), which has been optimized with respect to high bollard pull and high free running performance using the latest computational methods.

This nozzle is more streamlined and uses a more efficient diffuser when compared, for example, to the well known 19A nozzle.

Moisture Monitoring by Smart Hydraulics

The oil circulation in the thruster is handled by pump connected to the hydraulic system. In the hub itself, however, oil is circulated by means of a controlled leakage from the hydraulic system to the lubrication system. Thanks to this constant flow, oil can be monitored for moisture, cooled, and filtered. Furthermore, moisture content is displayed continuously.

Structural Optimization

Berg Propulsion uses finite element structural optimization schemes to optimize the structure. The structure is designed to maximize lifetime, and it is analyzed both statically and dynamically.

Maximized Efficiency by Centering the Nozzle

In reality, when all tolerances are considered, it is impossible for the propeller to be perfectly centered without adjusting the nozzle position.

However, by using our patent pending mechanism for moving the centre of the nozzle to coincide with the centre of the propeller, a regular and even gap can be created between the nozzle and the propeller. The result is zero losses in nozzle and propeller efficiency.



Hydrodynamic optimization by CFD simulations



Structural optimization and verification by advanced simulations

Unique Nozzle Attachment Simplifies Mounting/Dismounting

Our nozzle attachment makes it easy to mount and dismount the nozzle - this is advantageous both at the installation stage and in service.

Optional Stem Length to Fit any Hull

Our Customer-driven design has been developed specifically so that it can be adjusted to fit any hull.

Feathering

Using the BAT with the feathering BCP hub opens up a world of opportunities regarding the flexibility and efficiency of the vessel. The azimuth unit can be turned off during the operation of the vessel to minimize resistance in the water, which makes it possible to reduce the number of units used for driving the ship.

This is a very effective way to vary the speed of the ship while retaining high efficiency from the propulsion units.

Easy Propeller Shaft Seal Service Owing to a Split Rope Guard

Using a split rope guard, it is possible to service the propeller shaft seal without dismounting the hub. By dismounting one part of the rope guard, the sealing lips thus become fully accessible and replaceable, facilitating easier and faster BAT service. Rope guard, net cutter and wire winder are included as standard.

Convenient Oil Draining

The bottom of the thruster is supplied with lubrication oil. As well as achieving good circulation and cooling performance, this makes it possible to drain lubrication oil or take oil samples from inside the vessel.

Quadrupled Azimuth Sealings

The unit features two sealing lips facing inwards, towards the oil, with two other lips facing outwards towards the water. Between these pairs of lips, there is a void space.

Any water or oil that leaks into the void space between the water seals and the oil seals is conveyed to an inboard container, featuring a readable gauge. Thus, any leakage can be detected and controlled.

In most cases, this means that the vessel can be operated normally until it is possible to dock.

Smart Long Life Azimuth Sealing Liner

Berg Propulsion have minimized the risk of having to replace the liner by developing an intelligent sealing solution. In brief, this comprises two spacers that make three different sealing positions possible on the liner, thus extending liner life.

Classification

The BAT meets the requirements of all major classification societies.





Z-DRIVE



FEATHERED



L-DRIVE

