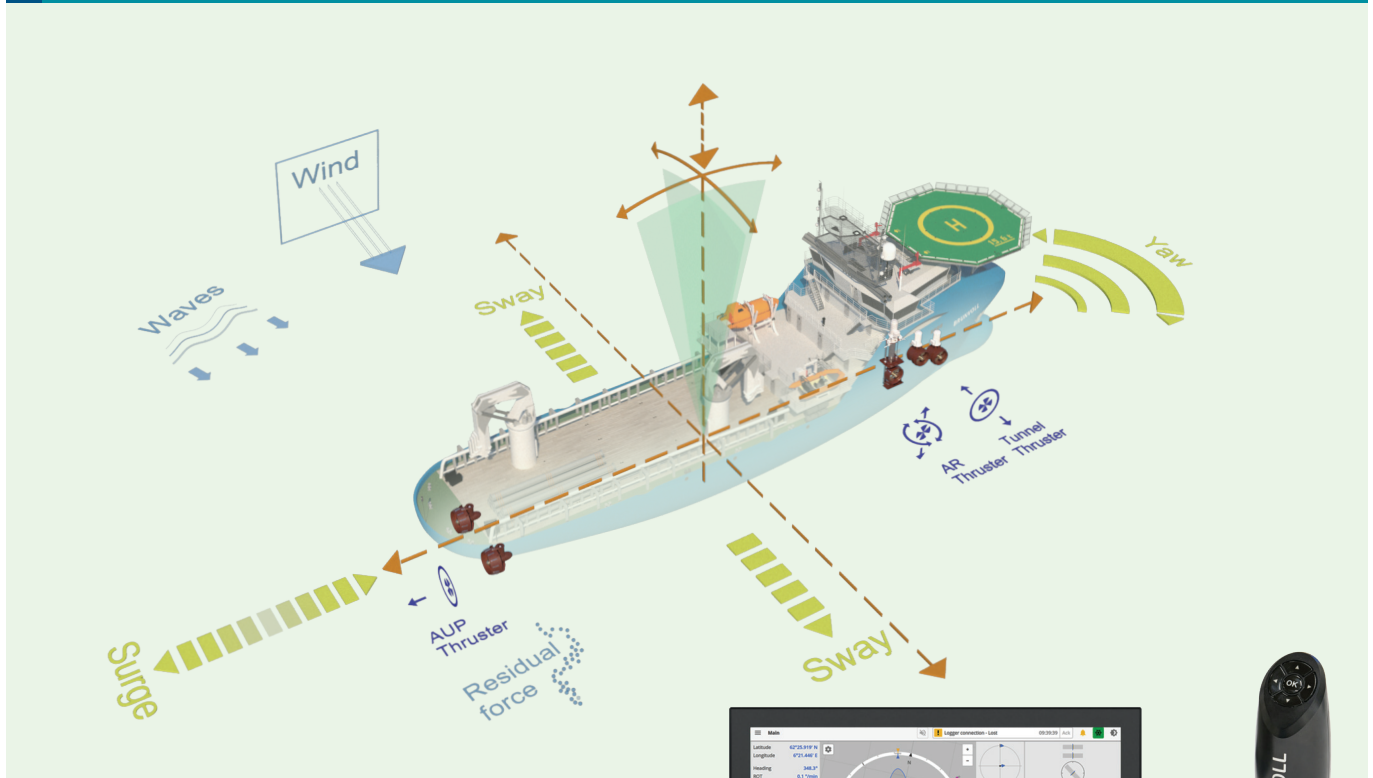
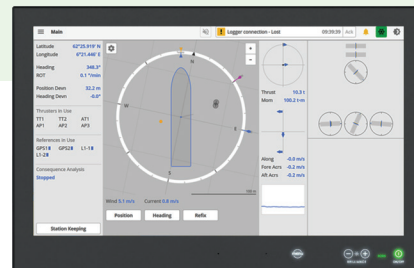


BruCon

Dynamic Positioning System - Retrofit Solutions



Brunvoll Dynamic Positioning (DP) and Joystick (JS) systems, with focus on enhanced user experience and performance. Designed for all kind of vessels.



- BruCon DP requires a very small footprint and can therefore easily be retrofitted onboard a sailing ship.
- A skilled team will visit the ship and inspect the current installation after which a report with recommendations on what can be reused will be presented.
- Existing DP sensors, position reference systems, UPS and cables can be utilized as a part of the new BruCon DP control system if they are fully functional and fit for purpose.
- The BruCon DP system will ensure an optimum and energy efficient thruster usage with the most user friendly experience.
- BruCon DP is designed for optimal thruster allocation with focus on reduced energy consumption, wear and tear.
- BruCon DP follows our long traditions for in-house product development.
- Intuitive system operation. Designed for low user threshold.
- All basic modes of operation required from a modern DP system are included in the standard BruCon DP delivery.
- Optional functions are available for more advanced DP operations:
 - Follow target
 - Waypoint tracking
 - Wind turbine field mode
 - ECO DP
 - Online capability plot

DP2 Single Line Diagram

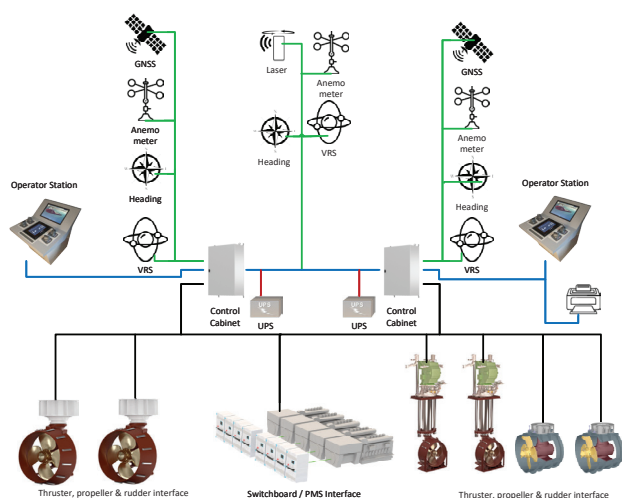


Figure 1. Before BruCon DP Retrofit

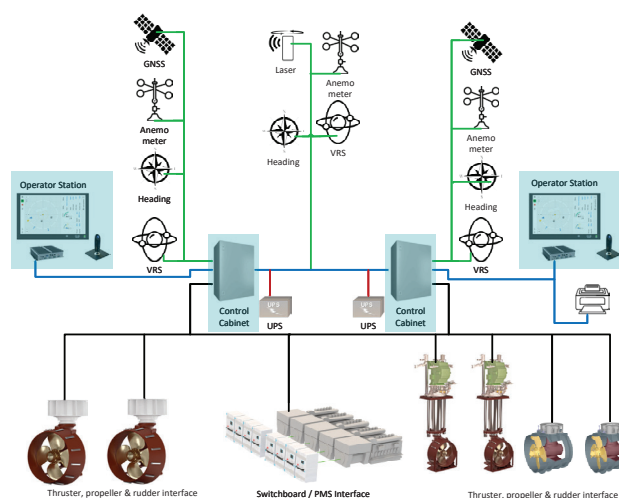
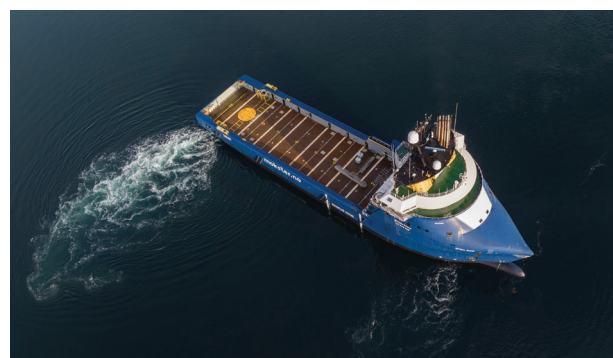


Figure 2. After BruCon DP Retrofit. New items marked in green

A typical DP retrofit installation is shown above, illustrating the minimum replacement of control cabinets and operator stations.

Interface between BruCon DP system and existing thruster, propulsion and rudder remote control system shall be of discrete type.



MS "Stril Mar" - in operation after retrofit installation of DP2

Requirements for DP systems

Equipment	DP class 1	DP class 2	DP class 3
Control systems with operator station	1	2	2 + 1 back-up
Independent joystick with auto heading	Yes	Yes	Yes
Manual levers for each thruster	Yes	Yes	Yes
Heading sensor	1	3	2 + 1 back-up location
MRU	1	3	2 + 1 back-up location
Wind sensor	1	3	2 + 1 back-up location
Position reference system	1	3	2 + 1 back-up location
UPS	1	2	2 + 1 back-up location

- Developed in-house by the Brunvoll Autonomy team with more than 20 years' experience from the DP industry, including developing.
- DP control systems for more than 300 vessels within various market segments.
- The DP products are built on the fifth generation BruCon control system software platform. The same platform is used for propulsion & thruster control systems, CMS and autonomy products.
- BruCon simplifies maintenance and reduces spare part stock by standardizing on «off the shelf» hardware.