KSR – KING SUPPORT RUDDER

In order to avoid the disadvantages of conventional rudders Becker has developed the KSR (King Support Rudder). With this solution Becker is able to satisfy special rudder requirements with unlimited size and slim profile thickness. In this arrangement, the rudder trunk is extended into the rudder blade so that the propeller loading is positioned as close as possible to the centre of force acting on the rudder. Due to the direct force 1x2,3x4 and bending moments in the rudder stock and trunk are significantly reduced. The propeller position in the hub and carrier bearings are much smaller, making it a very light rudder.

KSR technology is the state-of-the-art solution for rudders of unlimited size, and with only one rudder bearing it provides lower maintenance than comparable semi-spade rudders. Becker Rudders do not install any castings such as a rudder horn with angles to the blades that may cause cavitation problems and are much difficult to install in the ship’s hull structure. Furthermore, a KSR rudder offers a larger active steering range and a decreasing the course-keeping angles. It can also be deflected to higher rudder angles to provide highly efficient manoeuvrability. Due to reduced force with the KSR support, the rudder profile can be designed to be more slender and thus improve efficiency.

BBMS – BECKER BEARING MONITORING SYSTEM

The Becker Bearing Monitoring System (BBMS) monitors wear on the rudder neck bearing by means of triaxial wear sensors contained in the neck bearing bush. The sensors are sewn out along with the bearing bush, thus removing the need for the neck in each carrier bearing. The measured neck bearing clearances is transmitted via a cable connection to the processing unit mounted in the steering gear room. The processing unit incorporates a 3.5” touch panel to calibrate the system and display the monitored values as well as the wear history of the neck bearing. Via the processing unit, the next bearing clearances and measurement values can be interfaced to any other monitoring and alarm system aboard the ship. Continuous monitoring enables better service planning and makes underwater inspections of the neck bearing unnecessary.

BBMS is the technology for improving safety and performance by giving the rudder force online, while monitoring it. The Becker Intelligent Monitoring System (BIMS) is able to directly measure the rudder force. This information is provided to the ship navigation system and displayed on bridge and steering core room. Improved navigation, precise DP and more efficient AP operation are the highlights of following benefits.

• Determination of rudder AP, drag and torque
• Serial and network interfaces to navigation systems such as autopilot (AP) and dynamic positioning (DP) systems
• Power rudder motions during AP and DP operation
• Energy savings and emission reduction through improved efficiency

Rudder Force

BIMM – BECKER INTELLIGENT MONITORING SYSTEM

Until now modern navigation and positioning systems have been using rather general output signals for rudder control operation while manoeuvring, because the force generated at a specific rudder angle is not so exact in the navigation system, resulting in a less efficient manoeuvring. The Becker Intelligent Monitoring System (BIMS) is able to directly measure the rudder force. This information is provided to the ship’s navigation system and displayed on bridge and steering core room. Improved navigation, precise DP and more efficient AP operation are the highlights of following benefits.

• Efficiency
• Ice class
• Length between perpendiculars
• Speed
• Manoeuvrability requirements
• Propeller diameter
• Shaft
• Efficiency

For all different demands, Becker has the right solution combining operational experience with innovations, quality, efficiency and environmental aspects.

The reduction of emissions and use of environmentally-friendly materials are among the company’s main important goals. The latest generation of Becker Rudders minimizes maintenance and service requirements, by employing special bearing materials and coatings which allow lubricant-free rudder operation. This solution fully complies with EU Green Charter DP requirements. It is no longer necessary for the vessel operator to buy expensive bio-grease to protect the trunk and shaft from corrosion.

With a variety of electronic options, Becker is able to monitor bearing wear and tear and report the highest rudder efficiency directly to the captain by showing him the actual rudder force online.

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BECKER FLAP
The Becker Flap Rudder is the ultimate flap solution when it comes to ship manoeuvrability. Decades of research, development and practical experience make it the widest range design of all flap rudders in the shipbuilding industry. The Becker Flap Rudder is the best solution for your vessel at all speeds with the lowest fuel consumption possible.

With a Becker Flap Rudder, captains are able to operate the vessel intuitively. Especially in smaller ports or during river operations the Becker Flap Rudder shows its excellent performance. The improved linkage and hinge system reduces wear and tear and maintenance costs. The Becker Flap Rudder is suitable for retrofit and newbuildings. For retrofit Becker always tries to keep the existing steering gear/trunk arrangement to minimal investment costs.

Several options for enhanced system stability are available, including the twisted profile for reduced risk of cavitation damage, the King Support Rudder (KSR) bearing and heel point support.

ESPECIALLY SUITED FOR:
- Container vessels
- Bulk carriers
- General cargo vessels/
  heavy-lifters
- Car carriers
- Cranes
- Ferries
- Cruise vessels
- Offshore vessels
- Push boats
- Research vessels
- Fishing vessels
- Tugboats (Redbeck)

ADVANTAGES:
- Optimised profile
- Reduced cost
- No cast parts
- Manoeuvrability
- Symmetrical flap
- Flap angle up to 90°
- Improved course
- Improved course
- Reduced rudder angle
- Optimised profile

Options:

BECKER SCHILLING®
The Becker Schilling® Rudder is a high-lift rudder with a specially developed twisted profile offering improved manoeuvrability for vessels of all sizes and types. In special design the Becker Schilling® combines the highest performance with the best course stability. The stable shape supported by the twisted design guarantees improved safety and efficiency. It is available as a full spade rudder with optional KSR (King Support Rudder).

With its special shape the Becker Schilling® Rudder will minimise the rudder "hunting" under autopilot operation. Combined with a steering gear which is suitable for higher rudder angles up to 70° the Becker Schilling® can be used for cranking and DP-operations. Due to its specific design, the Becker Schilling® has no heel and fair parts, which also extenuates service and maintenance costs.

ESPECIALLY SUITED FOR:
- Shuttle tankers
- Container vessels
- Cranes
- Terminal towers
- Ferries
- Research vessels
- AHTS
- OSV/PSV
- ConRo/RoRo
- Cruise liners
- General cargo carriers/
  heavy-lifters
- Shuttle tankers
- LNG/LPG carriers

ADVANTAGES:
- Optimised profile
- Reduced cost
- No cast parts
- Optimised profile
- Crank main gear
- Power savings
- Reduced wear and tear

Options:

BECKER TWIST
The Becker Twist Rudder is a state-of-the-art rudder developed by Becker Marine Systems. It offers improved manoeuvrability and efficiency. It is especially suited for large vessels and protects against cavitation damage.

The closed and hydrodynamically optimised flap linkage offers excellent protection against mud and sand for the Becker Flap Rudder. The twisted design ensures any damage to the flap. Due to its flap angle up to 180° the equipped vessel is highly manoeuvrable with low resistance and excellent course keeping capabilities.

The Becker Flap Rudder with closed linkages is the perfect solution when it comes to high demands in manoeuvrability and toughness in harsh operation environments.

BECKER TWIST WITH CLOSED LINKAGE (HERACLES)

The closed and hydrodynamically optimised flap linkage offers excellent protection against mud and sand for the Becker Flap Rudder. The twisted design ensures any damage to the flap. Due to its flap angle up to 180° the equipped vessel is highly manoeuvrable with low resistance and excellent course keeping capabilities.

The Becker Flap Rudder with closed linkages is the perfect solution when it comes to high demands in manoeuvrability and toughness in harsh operation environments.

BECKER PERFORMANCE PACKAGE
A Becker Rudder in combination with a Becker Mewis Duct® or Becker Mewis Duct® Twisted improves the propulsive efficiency of the vessel. Additionally, the twisted profile allows higher rudder angles at higher speeds without cavitation. With the Becker Flap Rudder rotation corrosion and gap cavitation are prevented, resulting in lower overall maintenance costs.

Options: