SCD COMBI DRIVE – ELECTRIC AZIMUTH THRUSTERs

In combination with a power management system, electric drives increase the efficiency of the propulsion system and reduce fuel consumption. Electric energy generation systems on board are capable of producing only the power currently required and distributing it to the various consumers.

The desired thrust is set via the speed of the electric motor (frequency control). The connected generators always run at the optimum operating point. Combined with a SCHOTTEL Combi Drive offering a high hydrodynamic and mechanical efficiency, such a system is therefore particularly economical.

EFFICIENCY, THRUST AND PRECISE MANOEUVRING

The SCD is based on the SCHOTTEL Rudderpropeller (SRP), the mechanical azimuth thruster proven in decades of service in all sectors of shipping.

With the SCD, the SCHOTTEL engineers have implemented a concept uniting the decisive technical and economical advantages of the Rudderpropeller with the electric drive principle.

The SCD is available in both single and twin-propeller versions. In this respect too, the long positive experience with the mechanical SCHOTTEL Twin Propeller (STP) has been linked with the electric concept.

Its compact design makes the SCD an especially suitable choice when the available space is limited, as is the case with offshore supply vessels in particular. But the SCD is also an ideal propulsion system for RoPax and double-ended ferries, tankers, container ships and yachts.

The SCHOTTEL Combi Drive is based on the successful Rudderpropeller models SRP 1515, SRP 2020 and SRP 3030, with their proven mechanical components, and covers the power spectrum from 2000 to 3800 kW with propeller diameters ranging from 2500 to 3500 mm.

DOUBLE-ENDED FERRY BERGENSFJORD
4 x SCHOTTEL Combi Drive Type SCD 2020 (2750 kW each)

PSV BOURBON MISTRAL
2 x SCHOTTEL Combi Drive Type SCD 2020 (2200 kW each)
In contrast with other commercially available systems, in which the electric motor is housed in an underwater pod that is overdimensioned for this purpose, the motor in the SCD is vertically integrated into the support tube of the thruster and thus inside the vessel. The SCD therefore features a very compact, hydrodynamically optimized underwater housing. Furthermore, the SCD is easy to install and to maintain.

**ADVANTAGES**

- Combination of an electric drive system with proven mechanical components
- Outstanding manoeuvring characteristics thanks to 360° steerability
- Hydrodynamically optimized
- Electric motor is located in the support tube inside the vessel
- No shaftline required
- No aligning of motor and Rudderpropeller on the vessel
- No motor foundation
- Extremely compact design
- Easy to install
MORE POWER IN TRANSIT, LOWER FUEL CONSUMPTION

The twin propeller version is equipped with two propellers rotating in the same direction. The optimum matching of the system components “propellers” and “housing with integrated fins” results in a considerable increase in hydrodynamic efficiency as compared with systems incorporating just one propeller.

And all of this is achieved with a remarkably simple mechanical system incorporating only few rotating parts, since the SCD is equipped with just one reduction stage. As the drive motor is integrated vertically into the thruster, there is no need for an upper gearbox. This results additionally in improved mechanical efficiency.

OPERATING PRINCIPLE OF THE TWIN PROPELLER SYSTEM

The SCD is equipped with a pull propeller and a push propeller. Their relative arrangement is such that the vortex of the front pull propeller passes between the blades of the rear push propeller without impeding it. Contraction of the slip stream in the pull propeller means that more water reaches the push propeller from the sides, which further enhances the performance.

Moreover, the strut is hydrodynamically optimized and provided with compensation fins. The swirl energy generated by the pull propeller is thus recovered, leading to an increase in efficiency.

Not least the flow around the compensation fins creates a lift component in the thrust direction, which likewise optimizes the efficiency.

The hydrodynamic principle:

- Distribution of the power to 2 propellers results in a low (approx. 50%) propeller load
- Recovery of the swirl losses of the front propeller by means of the integrated diffuser system consisting of strut and fins
- Streamlined housing

These features make the twin propeller version particularly suitable for applications in transit operation involving medium and high speeds. Owing to the low propeller load, the twin propeller constitutes an especially low-noise means of propulsion.

IMR VESSEL GRANT CANDIES
2 x SCHOTTEL Combi Drive Type SCD 2020 (2250 kW each) / 2 x STT 4 CP (1000 kW each)
EFFICIENCY FOR MANOEUVRING AND DYNAMIC POSITIONING

**Well installation:**
The SCD can be installed in the vessel from below or from above. Connection to the vessel’s structure is accomplished in both cases via a single central flange.

Installation from below is carried out in a dry-dock. The SCD is drawn into the well of the vessel from below and bolted to the vessel’s structure through the flange.

Well installation from above allows the SCD to be installed in a floating vessel. The SCD is lowered into the well of the vessel from above and bolted to the vessel’s structure through the flange.

**DUCTED SINGLE-PROPELLER VERSION**

In combination with a ducted fixed-pitch propeller, the SCD has a higher efficiency particularly in the speed range between 0 and 13 knots.

This system is an especially suitable choice when static thrust, for example in dynamic positioning, or part-load operation is required. Typical applications are offshore supply vessels, anchor-handling tugs, seismic research vessels and cable ships.
Propulsion systems are only as good as their steering. Optimally adapted data exchange between the different components (propulsion units and joystick or steering console) is therefore top priority. A further priority is a user interface that is as intuitive as possible, enabling safe manoeuvring even with frequent changes of master. Here too, SCHOTTEL steering systems set the course, both literally and figuratively.

In close cooperation, electronics engineers and propulsion specialists develop complete steering and control systems (SST) custom-tailored for every application. Our product range covers everything from simple, manually-operated wheels coupled directly to the propulsion unit, right up to the remote-controlled computerized joystick of the Masterstick system. A joystick is used to control up to ten propulsion units, steering the vessel in the given direction and with the desired rotation.

The different operating and control modes as well as many other options are selected via a steering console. The use of freely programmable microcontroller circuit boards with an integrated field bus and industry-standard interfaces provides a high degree of flexibility and operational reliability. Our systems give the ship’s master the optimal “tool” for simple and safe navigation, manoeuvring and positioning of the vessel.

High-performance steering system
KNOW-HOW AND HIGHEST QUALITY FOR RELIABLE SOLUTIONS

Over 50 engineers based at our company headquarters develop tailored solutions in close cooperation with our customers. Right from the design stage, we lay the foundation for the quality that is expected of us. Through strong investment in research and development we ensure that all our products are distinguished by efficiency, reliable operation and exceptional quality.

The state-of-the-art machines and systems used in our production facilities operate with the greatest precision and make a major contribution to the constant high quality of our products.

We attach great importance to keeping a large part of our manufacturing in-house. This safeguards our know-how and ensures our flexibility and consistently outstanding quality.

From product development through to installation and commissioning – we ensure that our systems exhibit first-class workmanship and are expertly put into service. Advanced software, modern manufacturing technologies, high-quality materials and careful assembly by highly qualified personnel are essential elements in the value creation chain.
PROFESSIONAL PARTNERSHIP – THROUGHOUT THE VESSEL’S LIFE

As a SCHOTTEL customer, you benefit from individual, in-depth advice and support at all stages of a project, from planning and commissioning through to preventive maintenance.

A dense worldwide service network is ready to offer assistance and ensures the swift supply of spare parts – along with experienced SCHOTTEL technicians if required.

The name of SCHOTTEL traditionally stands for quality in engineering, with over 90 years of experience in design and the precision workmanship of a family-owned enterprise. Our innovative propulsion systems are a byword for reliability and high performance and set standards in global shipping.