Intelligent solutions for reliable wind turbines.
EMPOWERING FORCES.

Wind power is one of the most important sources of energy for the world of tomorrow. High-quality components, an ever-increasing degree of efficiency and a high level of availability are the deciding factors for competitiveness in the industry. For over 30 years, RENK has offered complete solutions in the form of gearboxes, couplings, slide bearings, test bench technology as well as condition monitoring for wind power. On this basis, RENK consistently continues to develop drive solutions and sets new standards for use in the on- and offshore sector with pioneering slide bearing technology.
Innovation
Pioneering technology for optimal resource utilization

Performance
Impressive high-performance and maximum availability

Profitability
Extended product service life due to high-quality slide bearings
The best conditions for success.
Wind turbines with a future.

Maximum efficiency with solution for an industry on the rise. RENK.

The deciding success factors for sustainable wind turbines are highest product availability, ever increasing power density and excellent product performance. RENK has been offering innovative and reliable solutions for on- and offshore wind turbines for more than 30 years.

Wind power is becoming increasingly important as an alternative to fossil fuels. The energy requirements of society are constantly increasing. The proportion of renewable energy is to rise to 50% in Europe by 2030. At the same time, one fifth of Germany’s plants are losing their remuneration for supply electricity to the grid due to aging technologies. While the challenge in the onshore sector is the question of gaining area, in the offshore sector the challenge is technology development in order to make the wind turbines even more efficient. The power density is constantly increasing thus innovations are the drivers for reliability and efficiency.

RENK’s technology defines new standards. The result are complete solutions for main gearboxes, bearings, couplings, condition monitoring and test bench technology. With the innovative slide bearing technology, RENK therefore sets new standards for on- and offshore wind turbine plants in terms of availability and quality and ensures an excellent plant performance as well as the best profitability.
With over 30 years of expertise, RENK products and solutions ensure the efficient transmission of forces in wind power.
RENK provides pioneering work for wind turbine gearboxes.

We are constantly and successfully perfecting technically-challenging products and services in the mega- and multi-megawatt range, both for on- and offshore applications. The results are focused on quality, efficiency and a high level of availability. Due to the experience in mastering extreme forces, RENK has established slide bearings in wind power technology as a sustainable alternative to conventional rolling bearings. The result of this unique development is innovative and low-wear slide bearing systems, which in combination with other innovations, such as an intelligent planetary bearing system, provide perfect results. They form the basis for increasingly compact gearboxes with maximum power density.
RENK slide bearing technology ensures consistently perfect results.

High level of availability, reliability and low maintenance costs.

Slide bearings make the difference with RENK’s unique gearbox design. Our powerful gearboxes are based on the proven slide bearing technology.

Innovative and wear-free sliding layer systems provide an extremely high power density – with the highest operational reliability. RENK combines its unique competences as a gearbox and slide bearing manufacturer to form a perfectly coordinated overall solution, which is customized to the success of the respective system.

Slide bearing technology permanently optimizes the levelized cost of energy.

For decades, RENK has had unique experience in the construction and consistent development of large gearboxes with slide bearings. They form the ideal basis for a perfect and efficiency overall system. The design of slide bearings is simple and safe due to hydrodynamic operation. Systems benefit from maximum availability, an ideal degree of efficiency and ensure maximum energy supply. This is how successful individual customer solutions are created. The sustainable result is an optimal LCoE.

RENK slide bearing technology. Advantages at a glance.
- Maintenance-free
- Space-saving design
- Modular design
- Extremely resilient
- High level of reliability due to less parts
- Maximum availability
- No service life limitation due to the optimal design
- Decades of experience
Solutions from RENK. The ideal basis for successful wind turbines.

RENK gearboxes with slide bearings are more than just a component of a wind turbine. Together with a RENK coupling and a RENK condition monitoring system, this creates a complete system that individually contributes to the maximum success of a wind turbine.
Consistent lightweight construction and outstanding performance in every operating state.

Variably applicable for all platform configurations: Innovative. Intelligent. Low-maintenance.

Maximum reliability due to the optimal load distribution and slide bearing technology: EQ-Gear combines maximum power density with compact dimensions in a unique way.

Operating conditions with different combinations of speed and torque place high requirements on gearboxes in wind power. Special materials as well as innovative coating methods ensure an optimal operation – even at extremely high pressures and very low speeds. An intelligent planetary bearing system ensures a uniform load distribution in the respective operating conditions and optimizes the meshing contact of the gears. The intelligent planetary bearing system in connection with the use of five planets maximizes the power density.

The EQ-Gear is suitable both for low and medium speed platform configurations in a coaxial design as well as for the high-speed drive train with an axial offset generator connection. In particular with the coaxial platform configuration, the wire required for the pitch control can easily be guided through the gearbox between the input shaft and output shaft. The unique wireless temperature monitoring ensures the remote maintenance of slide bearings as well as the optimized self-adjusting load distribution between the planetary stages. This results in an excellent overall system that is designed specifically for the drive train of the wind turbine: with a RENK coupling and a RENK condition monitoring system. Optionally, the entire system, including the electrical connection, can be simulated and validated.

EQ-Gear makes wind turbines more compact and reliable.
- Maximum power density
- Compact design
- Optimal load distribution
- Certified as per IEC and GL directives
Coaxial drive train
- Suitable for slow and medium speed generators
- Simple execution of pitch wire
- RENK coupling with innovative torque limiter makes it possible to adjust the coupling without disassembling the drive train

Efficiency
High power density and optimized load distribution due to the slide bearing technology

Reliability
Slide bearing technology optimizes the running operation

RENK EQ-GEAR. Radically optimized. For wind turbines of the future.
- Integrated slide bearing
- Optimal load distribution
- Reduced weight
- Reduced parts variety
- Intelligent state monitoring

Wireless temperature monitoring of the planetary slide bearings

5 orbiting planets

Gearboxes with slide bearing technology

Oil supply unit

Eccentric axial offset in the drive train
- Suitable for high-speed generators
- Small misalignments of the output shaft due to optimal system design between the gearbox and coupling
EQ-Flex.
Intelligent torque transmission for maximum system protection.

EQ-Flex: For reliable torque transmission between gearbox and generator.

EQ-Flex provides the reliable transmission of the torque and ensures the torque limitation in the event of an overload. Sturdy materials ensure long service life in the most challenging environmental conditions.

The RAFLEX® portfolio offers the ideal solution for almost any application area due to our products from the standard and high speed series. A torque limiter and an electrical insulation to protect other system components from leakage currents were developed for use in wind turbines in particular. Operators benefit from maintenance-free and the wear resistance as well as from a technical functional design appropriate to the system. The use of high-quality, certifiable materials ensures the sustainability of the system as well as the easy assembly, compact and simple design.

EQ-Flex steel disk coupling consist of optimized as well as maintenance-free and wear-free components. They are designed for a complete system life time, even in the most demanding environmental conditions. Due to the layered structure of the specially shaped disks, these couplings compensate axial, radial, and angular misalignments between the drive and driven machines without generating high restoring forces.

An innovative and patented torque limiter gives the coupling decisive advantages for enhancing the system availability and optimizing the maintenance costs. An adjustment of the slip torque is now possible for the first time within a few minutes without disassembling the coupling. Especially for the coaxial platform configuration, the use of RENK torque limiter simplifies the coupling adjustment and avoids the complex disassembly of the pitch wire.

High-quality couplings for the most demanding application areas.

Our innovative and patented slip system ensures a variable and stable slip torque during operation – without disassembling the coupling in the drive train or recalibrating in the test bench.

EQ-Flex.
Experience and quality.
RENK has decades of experience with the coupling series RAFLEX® as well as with safety couplings and torque limiting couplings, which are also used in numerous other industries and applications.
**Quality**

Wear-free and low-maintenance materials ensure continuous operation

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**Flexibility**

Unique slip element adjustable with a high accuracy

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EQ-Flex steel disk couplings:

- with innovative torque limiter for a constant slip torque
- Slip accuracy already from ±5%
- The slip torque can be adjusted individually according to the respective requirements of the wind turbine when installed in the system

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Find out more online about the EQ-Flex steel disk couplings from RENK.

www.renk-ag.com/goto/l-dfaa61b
Quality, control and flexibility – for all components.

The best solution for any situation – even before going into continuous operation. Test systems make the processes of systems and components transparent, thereby ensuring decisive advantages for operators with respect to efficiency and success. This makes operating situations reproducible and they can be simulated as needed.

A high level of flexibility and short setup times qualify test benches both for prototype testing and for the efficient quality testing of entire series, such as through factory acceptance tests (FAT) or testing under extreme climatic conditions.

RENK test systems ensure functionality and yield for manufacturers and operators.

The innovative wind power gearbox test benches are delivered as turnkey complete systems with a CE mark. This eliminates the costly interfaces and technical safety risks for the customers. The modular design provides a high level of flexibility and the safe overall operational setup ensures a very good maintenance accessibility. Nevertheless, the setup times remain low with the optimal layout due to the flexible to use torque supports. The respective test runs are then reproducible to an extremely high degree due to the automated operation management and the RENK automation system (RDDS) documents measured values and logs reliably and securely.

RENK test benches, Factors for operationally reliable wind turbines.
- Flexibility due to the modular design
- Reproducibility of the test runs due to the automated operation management
- Practical gearbox testing through electrical and mechanical clamping circuits
- Individual development in close cooperation with operators and partners

Successful systems through precise analysis.
Our test systems make systems and their relationships transparent – for maximum success in ongoing operation.
Maximum reliability with optimal development time: Test benches for drives and gondolas.

RENK test benches, in particular for drive train components and entire gondolas, reproduce the ongoing operation under real dynamic movements, including the actual forces and torques of the simulated wind loads. This makes successful use possible in development, type testing and series testing. RENK test equipment for wind turbines analyzes the components in interaction and verifies the overall system behavior.

RENK test systems for wind turbines
- Gondola
- Gearbox
- Main rotor bearings
- Rotor blade bearings and azimuth bearings
- Generator

Profitability
Automated operation ensures reproducible test runs

Functionality
Measured values and logs completely document tests

Learn more online about the test systems from RENK.
www.renk-ag.com/goto/n-d05c64c
Intelligently networked:
The RENK VIB-Monitor surveils wind gearboxes and couplings.

The RENK VIB-Monitor uses data intelligently, automatically and safely.

The RENK VIB-Monitor works with a systematic early fault detection. The system is modular and adjusts to any existing gearbox. Smartly controlled. Ideally planned. Correctly logged. The RENK VIB-Monitor offers maximum transparency.

In addition to the permanently installed vibration monitoring system, the RENK VIB-Monitor and our team of experts are also optionally available for one-off vibration measurements and analyses on site. Both versions increase the system availability through a precise early detection of faults and wear, thereby ensuring a predictive and sustainable operation and service planning as well as an optimal spare parts management.

The RENK VIB-Monitor analyzes all relevant parameters of drives, couplings, and gearboxes. The system logs key data and transmits it to the head office via high-quality cryptographic communication standards. If desired, this is also done in the form of individual reporting.

This cross-system condition recording forms the basis for the effective operation of the entire system. The data is either stored locally or directly in a certified RENK data center through secure connections. Highly qualified service personnel can always check the system status.

Maximum operational reliability
VIB monitors the gearbox vibrations and the bearing temperatures. Operators can thus respond to irregularities in due time and adjust the system operation strategy.

Advantages for sustainable wind turbines
- Automatic analysis of all recorded parameters
- Intelligent integration of process data of the system control
- Early fault detection for optimal planning of operation and repair
- Smart spare parts management to minimize stoppages
Availability
RENK ensures logs and analyses in real-time

Transparency
Aggregated mapping of all states in the system at a glance

Vibration measurement
Bearing temperature measurement
Torque and speed measurement
Monitoring the oil supply

Learn more online about condition monitoring from RENK
www.renk-ag.com/goto/p-5240c45
RENK offers the best products and solutions – throughout the entire life cycle.

RENK is a driver of innovation and strong partner in the field of wind power technology. Always. And everywhere. As a One-Solution-Provider, RENK offers holistic and reliable solutions from a single source and blends customer proximity with State-of-the-Art-Technology. RENK thus shapes the future of superior wind turbines – with excellent process intelligence, unique project expertise and the highest quality standards for methods and materials.
Successful wind turbines with a future are created together.

Project expertise for wind turbines means quality and perfection during the design and modeling. Experienced experts plan individual designs for every challenge together with our partners. This makes turbines into tailor-made complete systems. From the beginning.

Already in advance, our experts digitally sketch the entire drive unit – always optimally embedded in its respective environment. Simulation calculations ensure that all components of the gearbox are designed to be operationally reliable. Realistic component deformations and the stress of materials are also precisely determined.

Success according to plan: All components in perfect interaction.

Already during planning, we optimize components together or realize a homogeneous stress distribution. That’s because RENK has extensive experience in simulating and validating the entire system, including the electric connection. Programs for torsional vibration calculation and multi-body simulation can simulate the operational behavior of the wind turbine down to the rotor blades while taking all interfaces into consideration.

For certification, RENK provides support according to recognized guidelines, such as those of the German Lloyd or IEC 61400. RENK wind gearboxes are more than just a component of a wind turbine. Equipped with a unique overall system, which is specifically designed for the drive train of the respective wind turbine – thereby ensuring its successful operation.

Through individual project planning, the interactions of all components are already taking into consideration when designing the plant.

Safety through project expertise. Together with its partners, RENK develops custom designs for efficient wind turbines with absolute guideline compliance.
Success through project expertise. RENK is a reliable partner in the development of sustainable wind turbines.
Maintenance for maximum efficiency. Always and everywhere.

More than maintenance: On-site service, upgrades and original parts.

Maintenance from RENK means service without compromising – anywhere, anytime. RENK takes care of planning and executing all of the tasks involved in new assemblies, commissioning, inspection and maintenance work. Our qualified assembly and commissioning personnel also carry out standard upgrades and overhauls to guarantee the operational reliability of all of your systems.

Optimal planning, the availability of qualified personnel, and the necessary parts and tools ensures that all work runs smoothly. You can depend on the work being performed professionally and on-time, and know that you’ll receive a transparent breakdown of the costs. Based of our expertise, we offer quick service to guarantee the maximum availability of your systems.

All-round services for the maximum availability of the system.

On-site service: Many repairs are already possible on the system. Our competent service engineers have the necessary certificates to be able to work on the system. On- and offshore.

Examination and repair: If it is not possible to repair the system, we analyze and optimize the gearbox at our plant. Then it is just like new.

Upgrades: Upgrades can increase the efficiency and thus the value of existing gearboxes – and often can be carried out directly by our specialized personnel. This saves money and optimizes operation.

Original parts: RENK parts are unrivaled as regards their performance, functionality and quality. Original parts ensure decisive advantages in terms of efficiency and success.

RENK assumes responsibility for efficient and sustainable wind turbines. We do everything we can to ensure the availability of all systems and the competitiveness of the plant.

Safe. Professional. Reliable. RENK supports success, optimizes efficiency and ensures the operation of wind turbines with the best on demand support.
RENK maintenance.

The services:
- On-site service
- Examination and repair
- Upgrades
- Original parts
Follow the QR code and learn more online about RENK solutions for wind turbines.