



HKW
HEINZ KÜHLWETTER



INTRODUCTION TO GERMAN HKW COMPANY

德国HKW公司介绍

德国百年机械制造经验

A Century of Mechanical
Manufacturing Experience in Germany

SINCE 1921



德国百年精工

每一转都值得信赖！

A Century of German Precision Engineering – Every Rotation You Can Trust

目录 INHALTSVERZEICHNIS

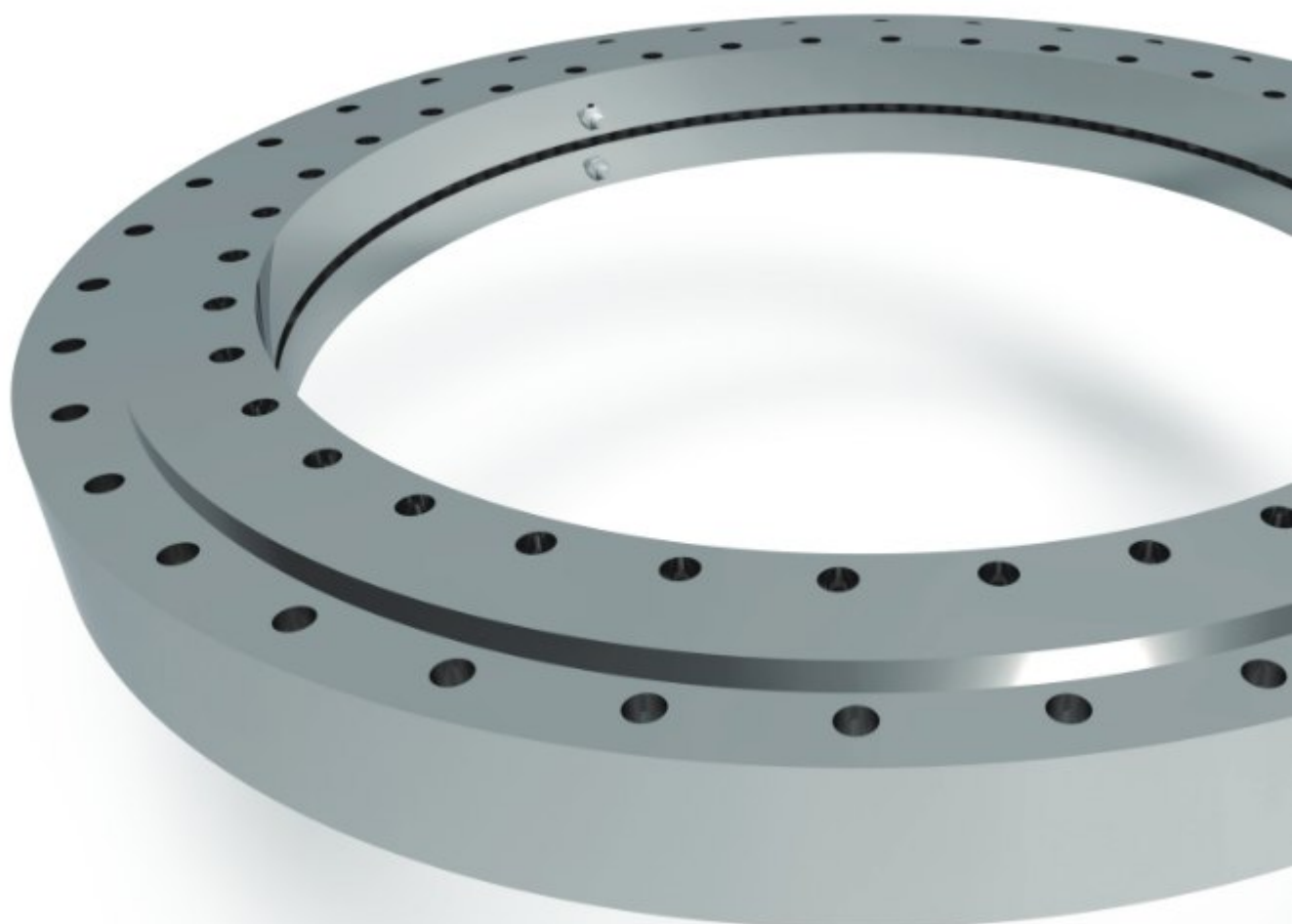
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HKW概述

Overview of HKW



In 1921



In 1945

HKW
HEINZ KÜHLWETTER



1921年起，HKW 早期深耕齿轮供应与轴承研发，以卓越品控和技术服务赢得全球信赖。

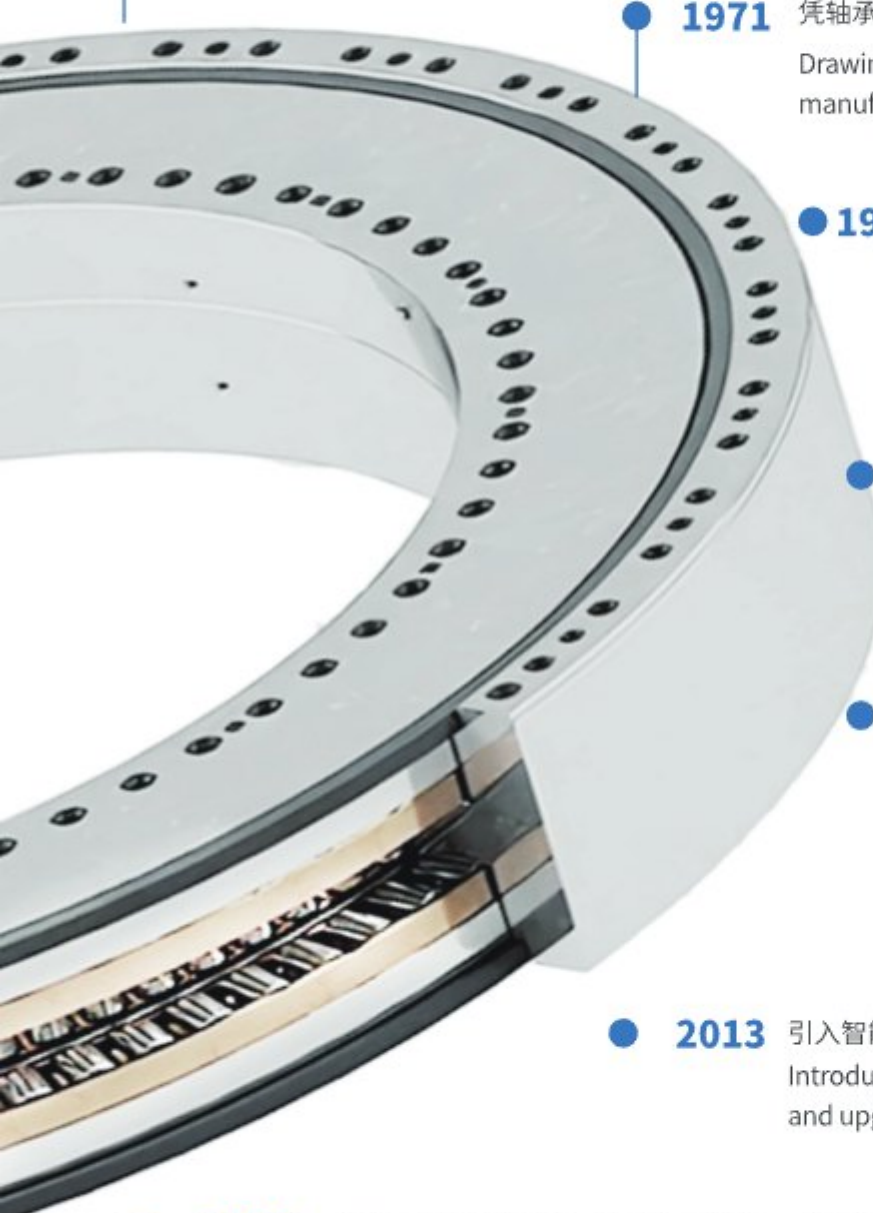
1985年起，HKW 专攻风电发电机组回转支承研发，成为该领域早期供应商。历经积淀，现已形成完备产品线，覆盖设计、制造及销售全链条，凭深厚经验为客户提供优质产品与服务。

Since 1921, in its early stage, HKW has deeply engaged in gear supply and bearing R&D, and has won global trust with its outstanding quality control and technical services.

Since 1985, HKW has specialized in the R&D of slewing bearings for wind turbines, becoming an early supplier in this field. After years of accumulation, it has now developed a comprehensive product line covering the entire chain of design, manufacturing and sales, and provides customers with high-quality products and services based on its profound experience.

HKW成长历程

HKW Development Journey

- 
- **1921** 赫因茨·库尔韦特博士在德国科隆创立了Heinz Kühlwetter有限公司，做齿轮、球类轴承小工厂
Dr. Heinz Kühlwetter founded Heinz Kühlwetter GmbH in Cologne as a small factory producing gears and ball bearings.
 - **1971** 凭轴承齿轮经验，生产外齿式回转支承
Drawing on our experience in bearing drives, we manufacture external gear large rolling bearings
 - **1983** 推出重型回转支承系列，进军工程机械
Launch the heavy-duty slewing bearing series and enter the construction machinery sector
 - **1985** 研发风电用回转支承，布局风电赛道
Develop slewing bearings for wind power applications and lay out a presence in the wind power sector
 - **1995** 通过 ISO 9001 质量管理体系认证，夯实质量基础
Obtain ISO 9001 Quality Management System Certification to consolidate the quality foundation
 - **2013** 引入智能制造技术，生产流程升级
Introduce intelligent manufacturing technologies and upgrade production processes
 - **2020** 获欧洲机械工程协会“工业创新奖”，技术创新获行业认可
Win the "Industrial Innovation Award" from the European Association for Mechanical Engineering, with technological innovation recognized by the industry

产品介绍

Product Introduction

回转支承产品概述

Overview Of Slewing Bearing Products

三排圆柱滚子回转支承

Three-row Cylindrical Roller Slewing Bearing

双列四点接触球式回转支承

Double-row Four-point Contact Ball Slewing Bearing

回转驱动

Slewing Drive

陶瓷球轴承

Ceramic Ball Bearing



回转支承产品概述

Overview Of Slewing Bearing Products

- 直径 200 mm ~ 6500 mm

Diameter: 200 mm ~ 6500 mm

- 无齿/带外齿/带内齿

Toothless / With External Teeth / With Internal Teeth

- 所有轴承类型，球式，滚子或组合轴承

All bearing types: ball, roller or combined

- 所使用钢球大小从12mm ~ 100mm

The size of the steel balls used ranges from 12 mm to 100 mm

- 所使用滚子大小从16mm ~ 120mm

The size of the rollers used ranges from 16 mm to 120 mm



HKW 21-B/A-30-1506 双列四点球式回转支承

HKW 21-B/A-30-1506 Double-Row Four-Point Contact Ball Slewing Bearing

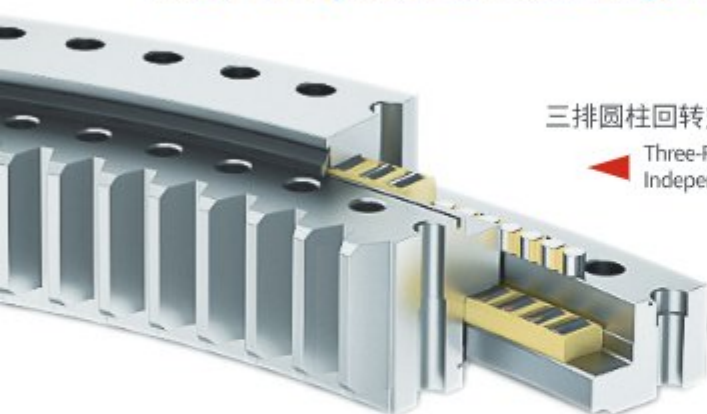


HKW 31-B/A-20-1250 三排圆柱滚子回转支承

HKW 31-B/A-20-1250 Triple-Row Cylindrical Roller Slewing Bearing

三排圆柱滚子回转支承

Three-row Cylindrical Roller Large Slewing Bearing



三排圆柱回转支承独立变桨轴承

Three-Row Cylindrical Slewing Independent Pitch Bearing



HKW

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- **基于三排圆柱滚子轴承结构，配备高性能整体保持架**
Based on a three-row cylindrical roller bearing structure, it is equipped with a high-performance integral cage
- **直接用紧固件连接，无需精密装配，且配备适合脂或油润滑的高性能密封系统**
Connected directly with fasteners, no precision assembly required, and equipped with a high-performance sealing system suitable for grease or oil lubrication
- **具备极端载荷的高承载能力，抗倾覆稳定性与刚性提升**
Possesses high load-carrying capacity for extreme loads, with improved anti-overturning stability and rigidity
- **寿命延长、可靠性优化，兼具紧凑性与系统集成优势**
Extended service life, optimized reliability, along with compactness and system integration advantages
- **动态性能良好，运维便利，且适应海上风电特殊环境**
It features good dynamic performance, convenient operation and maintenance, and is adaptable to the special environment of offshore wind power.

双列四点接触球式回转支承

Double-row Four-point Contact Ball Slewing Bearing

- **基于双列四点接触球式轴承结构，配备高性能整体保持架**

Based on a double-row four-point contact ball bearing structure, equipped with a high-performance integral cage

- **直接用紧固件连接，无需精密装配，且配备适合脂或油润滑的高性能密封系统**

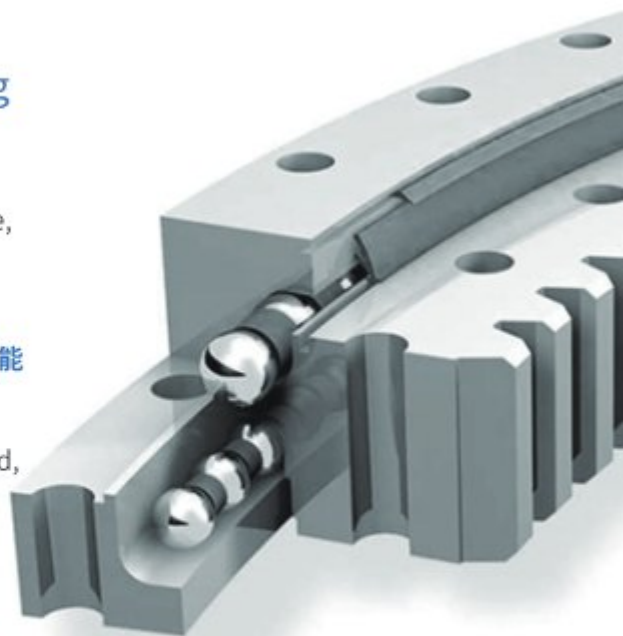
Connected directly via fasteners, no precision assembly required, and equipped with a high-performance sealing system suitable for grease or oil lubrication

- **具备高承载能力与长寿命，采用复合减摩技术且结构紧凑**

It features high load-carrying capacity and long service life, adopts composite anti-friction technology, and has a compact structure

- **独立变桨调节可降低载荷，适配大兆瓦机组趋势，且抗疲劳性能强、可延长轴承寿命**

Independent pitch regulation can reduce loads, adapt to the trend of large-megawatt units, and features strong anti-fatigue performance as well as extended bearing service life



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回转驱动

Slewing Drive



SE-L

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

156 mm - 713 mm

9kNm - 1095 kNm



GT-L

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

229 mm - 1091 mm

22 kNm - 353 kNm



SE-H

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

280 mm - 725 mm

94 kNm - 1052 kNm



GT-H

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

455 mm - 955 mm

153 kNm - 562 kNm



SE定制

SE Customized

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

≤980mm

≤3500kNm



GT定制

GT Customized

滚道直径

Raceway Diameter

最大倾覆力矩

Maximum Overturning Moment

≤1200mm

≤800kNm

陶瓷球轴承

Ceramic Ball Bearing

- 多以氮化硅为滚子材料

Mostly use silicon nitride as the roller material

- 轴承外径范围 $\Phi 16\text{mm}$ 到 $\Phi 350\text{mm}$

Bearing outer diameter range: $\Phi 16\text{mm}$ to $\Phi 350\text{mm}$

- 陶瓷球直径范围 $\Phi 3\text{mm}$ 到 $\Phi 30\text{mm}$

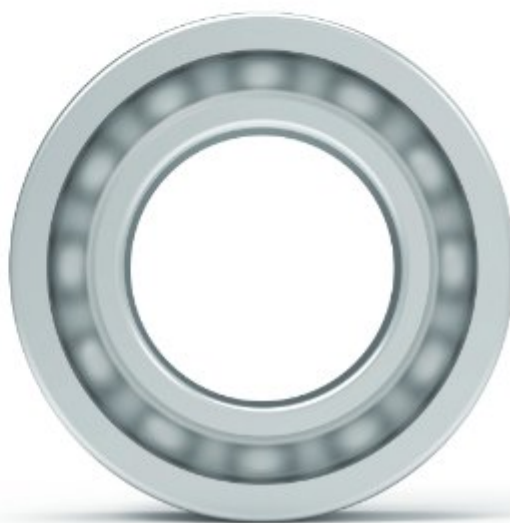
Ceramic ball diameter range: $\Phi 3\text{mm}$ to $\Phi 30\text{mm}$

- 使用寿命可达20年

Service life can reach up to 20 years



无密封混合陶瓷 单列深沟球轴承
Non-Sealed Hybrid Ceramic
Single-Row Deep Groove Ball Bearing



两侧带密封的混合陶瓷 单列深沟球轴承
Hybrid ceramic single-row deep groove
ball bearings with seals on both sides



技术展示

Technical Presentation

HKW风电轴承

HKW Wind Power Bearing

HKW技术研发

HKW Technology R&D

HKW: 有限元与试验双重验证

HKW: Dual Verification by Finite Element Analysis and Testing

HKW工业生产制造

HKW Industrial Production and Manufacturing



HKW风电轴承：技术引领，创新赋能未来

HKW Wind Power Bearings: Technology Leads, Innovation Empowers the Future



HKW拥有技术研发能力 以及多年风电行业经验

HKW possesses technological R&D capabilities and years of experience in the wind power industry

HKW 风电轴承工厂兼具深厚行业经验与强劲技术研发能力。研发部汇聚资深团队，借先进工具、模拟技术专注风电轴承设计优化及新材料应用，联高校科研突破技术，经测试快速转化成果；生产部以先进设施、严质量体系，靠自动化产线与国际设备高效生产高精可靠轴承，经验团队快速响应定制需求，凭成熟工艺为全球风电项目供货。

The HKW Wind Power Bearing Factory combines profound industry experience with strong technological R&D capabilities. Its R&D department brings together a team of senior professionals, which focuses on the design optimization of wind power bearings and the application of new materials by leveraging advanced tools and simulation technologies. It also collaborates with universities on scientific research to achieve technological breakthroughs and rapidly transforms research outcomes through testing. The production department, equipped with advanced facilities and a strict quality management system, efficiently manufactures high-precision and reliable bearings using automated production lines and international-standard equipment. Its experienced team responds quickly to customized needs and supplies products for global wind power projects by virtue of mature production processes.

HKW 技术研发：精益求精，应用可靠

HKW Technology R&D: Striving for Excellence, Ensuring Reliable Application



聚合数十位工程与工艺精锐，全链穿透设计到制造的每一环，让技术构想硬着陆。

It assembles dozens of elites in engineering and technology, penetrates every link from design to manufacturing across the entire chain, and enables the solid implementation of technical concepts.



撕碎标准化桎梏，以定制化设计直切场景痛点，精准适配多元需求。

Break the shackles of standardization, address scenario-specific pain points with customized design, and accurately meet diverse needs.



回转支承技术亮剑海洋、风电、军工等十数领域，在极端工况的淬火中，淬炼出碾压级应对能力。

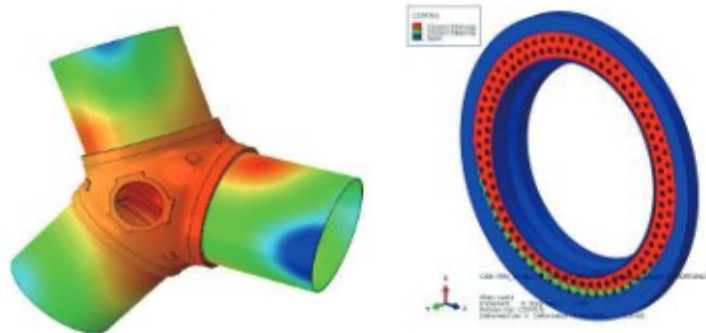
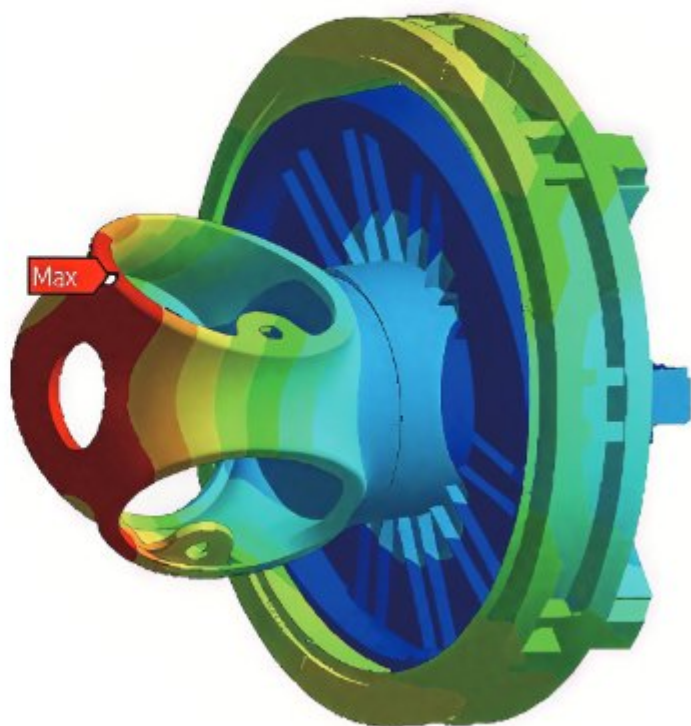
Slewing Bearing Technology Shines in Dozens of Fields Including Marine, Wind Power, and Military Industries, and Forges Unrivaled Adaptability Through the Tempering of Extreme Operating Conditions

HKW: 有限元与试验双重验证

HKW: Dual Verification by Finite Element Analysis and Testing

风电主轴承运用有限元技术 进行结构力学分析计算

Main Wind Power Bearings Utilize
Finite Element Technology for
Structural Mechanics Analysis and
Calculation



HKW试验设施

HKW Test Facilities

• 2018-2027年主轴承独家进行的专项实验
Exclusive Specialized Experiments on
Main Bearings (2018-2027)

• 适用于28兆瓦6500mm的主轴承
Suitable for the main bearing with
28 MW and 6500 mm



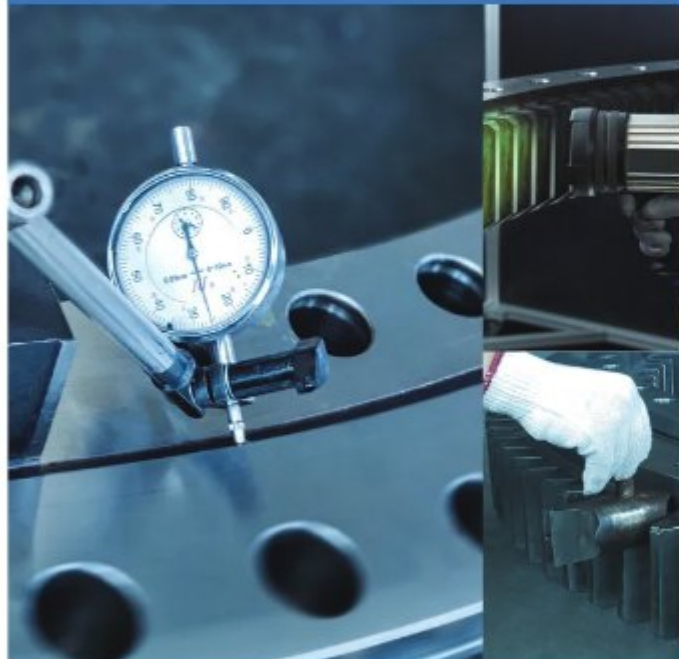
HKW工艺生产制造

HKW Process Production and Manufacturing



采用工业4.0质量管理体系，对产品生产制造严格把控

An industrial 4.0 quality management system is adopted to exercise strict control over the production and manufacturing of products



以最新的检测手段和技术检验滚动体，保持架和其它外协件

The latest testing methods and technologies are used to inspect rolling elements, cages, and other outsourced components

应用场景

Application Scenarios

回转支承应用场景

Application Scenarios Of Slewing Bearings

回转驱动应用场景

Application Scenarios Of Slewing Drives

陶瓷球轴承应用场景

Application Scenarios Of Ceramic Ball Bearings



回转支承应用范围：新能源领域

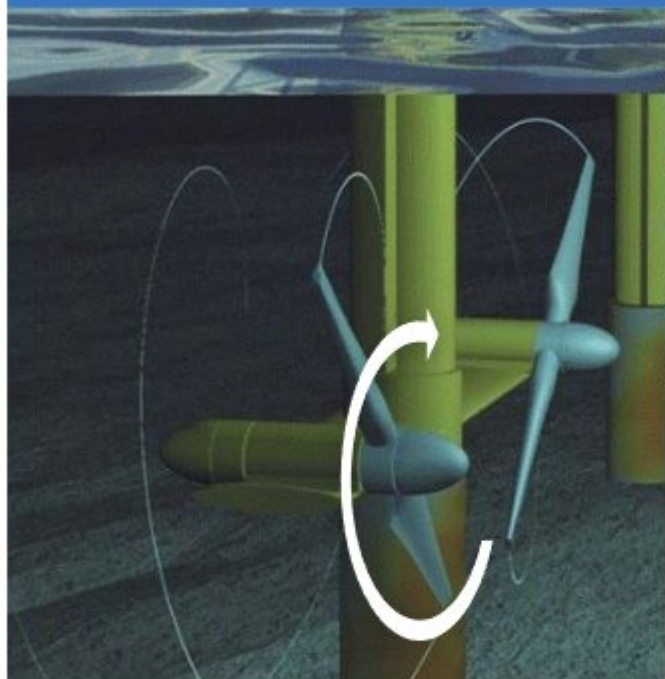
Application Scope Of Slewing Bearings: New Energy Field



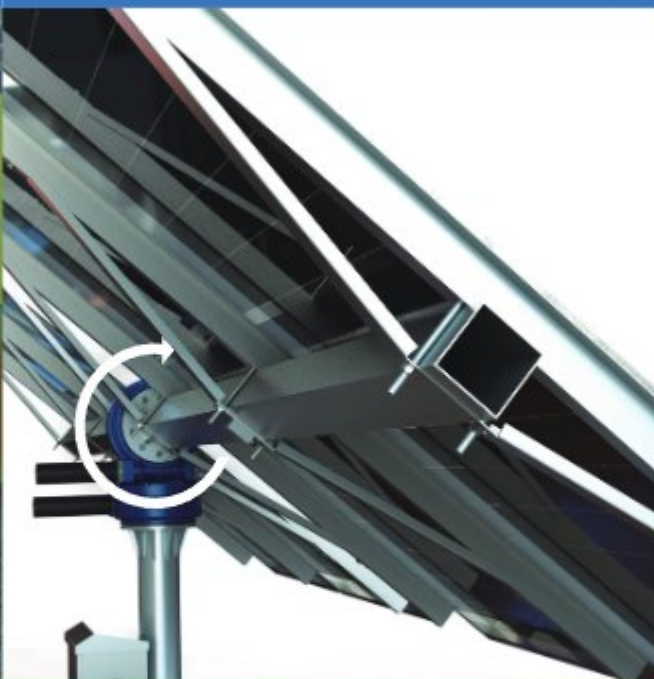
海上风力发电
Offshore Wind Power Generation



陆上风力发电
Onshore Wind Power Generation



潮汐发电
Tidal Power Generation



太阳能发电
Solar Power Generation

风力发电应用范围

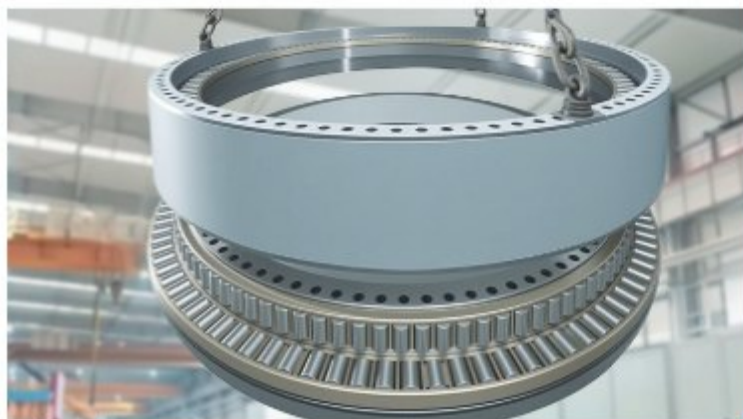
Application Scope Of Wind Power Generation

HKW三排柱主轴承应用范围:

Application Scope of HKW Triple-Row Cylindrical Roller Main Bearings:

适用于50KW~28MW直径最大6500mm的风电设备三排柱主轴承

Suitable for triple-row cylindrical roller main bearings of wind power equipment with a power range of 50KW~28MW and a maximum diameter of 6500mm



风力发电应用范围

Application Scope Of Wind Power Generation

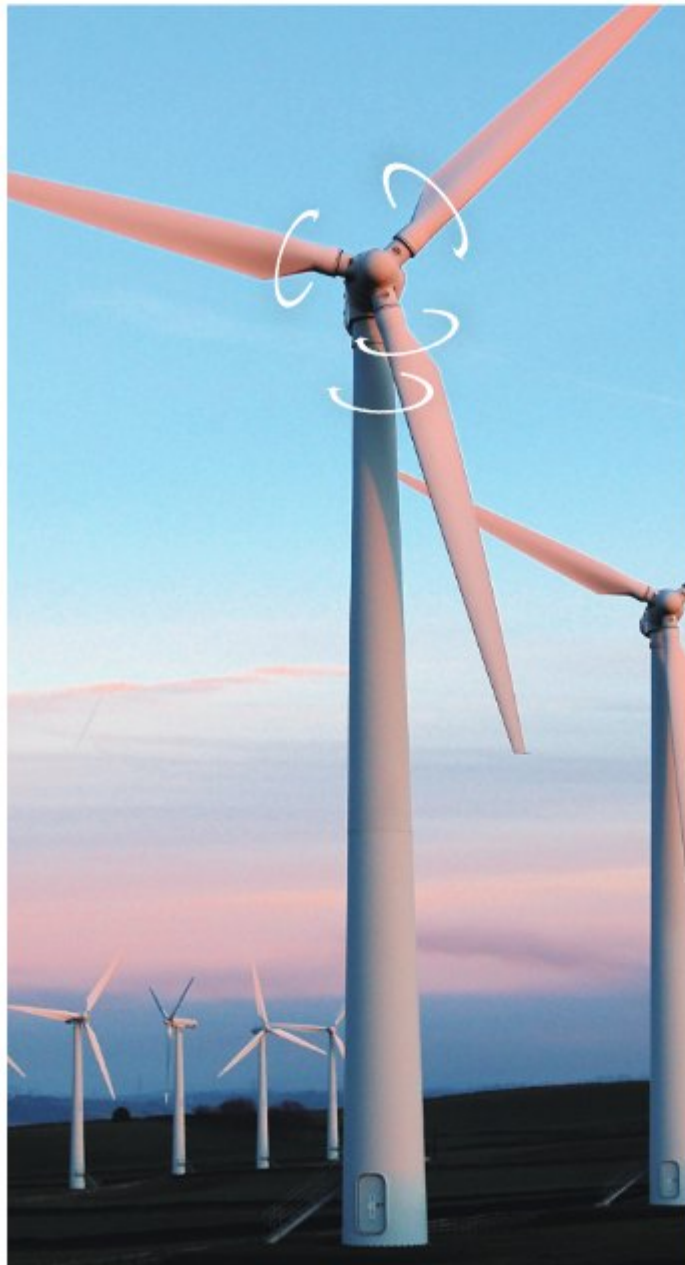
HKW陆上和海上风机变桨、偏航应用范围:

Application Scope of HKW Pitch and Yaw Systems for Onshore and Offshore Wind Turbines

适用于50千瓦至28兆瓦风机变桨轴承

1.5兆瓦到 25兆瓦风机的偏航轴承

Suitable for pitch bearings of wind turbines with a power range of 50 KW to 28 MW and yaw bearings of wind turbines with a power range of 1.5 MW to 25 MW



三排柱风电主轴承机组吊装现场

Hoisting Site Of Triple-row Cylindrical Roller Main Bearing Unit For Wind Power

8MW直径3200mm的风电设备三排柱主轴承吊装现场

Hoisting Site of Triple-Row Cylindrical Roller Main Bearing for 8MW Wind Power Equipment with a Diameter of 3200mm



回转支承应用范围——大型工程机械

Application Scope Of Slewing Bearings - Large-scale Construction Machinery



盾构机
Shield Machine



挖泥船机
Dredger



大型工程车
Large-Scale Construction Vehicles



挖掘机
Excavator



轮斗挖掘机
Wheel Bucket Excavator



振动压路机
Vibratory Roller



港口起重机
Port Crane



卸土机
Dumper

回转支承应用范围——其他领域运用

Application Scope Of Slewing Bearings - Applications In Other Fields



雷达天线
Radar Antenna



医疗器械
Medical Devices



饮料灌装
Beverage Filling



游乐场机械
Amusement Park Machinery



汽车制造流水线
Automotive Manufacturing Assembly Line



坦克
Tank



移动炮车
Mobile Gun Vehicle



陆战车
Land Combat Vehicle

回转驱动应用领域

Anwendungsbereiche Von Schwenkantrieben



太阳能发电

Solarenergie

小型风力发电机变桨与偏航轴承

Pitch- und Gierlager für kleine Windenergieanlagen

起重机回转机构

Schwenkeinrichtungen für Krane

特种车辆

Sonderfahrzeuge

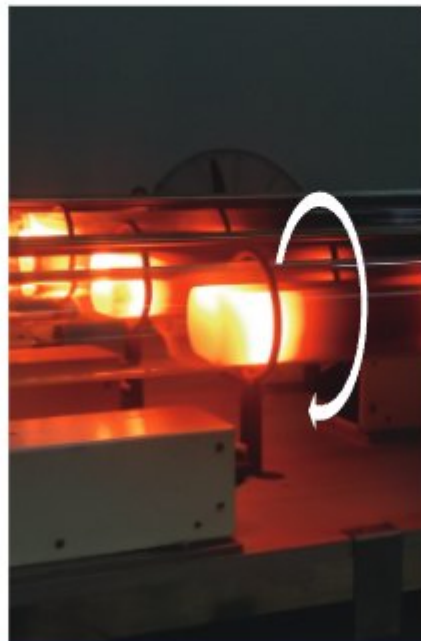


陶瓷球轴承应用范围

Application Scope Of Ceramic Ball Bearings



高速领域
High-Speed Field



极限温度环境
Extreme Temperature Environments



腐蚀环境
Corrosive Environments



绝缘、磁性环境
Insulating and
Magnetic Environments



航空航天领域
Aerospace Field



风力涡轮机（双馈型/永磁型/笼型）
Wind Turbines (Doubly-Fed Induction Type /
Permanent Magnet Type / Squirrel-Cage Type)

销售服务

Sales and Service

HKW 全球布局：销售服务伴您左右

HKW Global Layout: Sales and Service Are Always with You

HKW 以全球化布局覆盖五大洲，通过销售与服务站点，为全球客户提供生产、安装、销售全流程高效、近距离的销售服务支持，让业务每一环都紧密衔接，服务时刻在线。

HKW's Global Presence Spans Five Continents, Through its sales and service locations, HKW provides global customers with efficient, proximity-based sales and service support across the entire process of production, installation, and sales. This ensures every link in the business is closely connected and services are available at all times.



HKW 风电主轴承产品闭环服务流程

HKW Wind Turbine Main Bearing Product Closed-loop Service Process





HKW全球联系方式

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