太重集团
TZCO

太原重工股份有限公司
TAIYUAN HEAVY INDUSTRY CO., LTD

新能源领域
NEW ENERGY FIELD

产品宣传册

太原重工股份有限公司
TAIYUAN HEAVY INDUSTRY CO., LTD

地址：山西省太原市万柏林区玉河街 53 号　电话 (Tel)：0351-6364908
售后服务热线 (Service)：400-080-0533　邮箱 (E-mail)：info@tz.com.cn
邮编 (Post code)：030024

Add: No. 53 Yuhe Street, Wanbolin District, Taiyuan, Shanxi Province

官方网站　　微信公众号

INTRODUCTION
集团简介

太原重型机械集团有限公司（简称太重集团），始建于 1950 年，是新中国自行设计建造的第一座重型机械制造企业。主要成员单位包括太原重工股份有限公司、太原重型机械集团煤机有限公司、太重集团榆次液压工业有限公司等。公司拥有国家级技术中心和国家重点实验室，先后获得国家级发明奖 4 项、国家级成果奖 26 项、国家科技进步奖 23 项，创造了 460 多项中国和世界第一，为国家的建设、改革和发展做出了重要贡献，被誉为“国民经济的开路先锋”。

作为国内最重要的重型装备研发与制造基地之一，太重集团具有一流的装备制造水平和研发创新能力，是全国“创新型企业 20 强”之一，主要服务于轨道交通、矿山、冶金、煤炭、新能源、海洋工程、航天等领域，产品涵盖了铁路装备、露天矿和井工矿采掘输送设备、冶金设备、风力发电设备、工程机械、化工装备等，拥有设备成套和工程总承包能力，产品已出口到全球 50 多个国家和地区。

Taiyuan Heavy Machinery Group Co., Ltd (referred to as “TZCO”), founded in 1950, has been the first self-designed-and-built heavy machinery manufacturer since 1949. It is composed of Taiyuan Heavy Industry Co., Ltd, Taiyuan Heavy Machinery Group Coal Machinery Co., Ltd, Taiyuan Heavy Machinery Group Yuci Hydraulic Industry Co., Ltd etc. It has one nationally recognized technology center and one state key laboratory.In addition to four national prizes for new inventions, 26 national achievement prizes, and 23 national scientific progress prizes, It has made over 460 No.1 technology achievements in china and the world at large. It is known as “Trailbreaker for National Economy” for its important contributions to the national reform and development.

As one of the most important bases of R&D and manufacturing for heavy manufacturing in China. TZCO is one of the “Top 20 Innovative Enterprises” in china , with first-class equipment manufacturing, R&D and innovation capabilities . Its products are widely used in fields like rail transit, mining, metallurgical, coal, new energy, marine engineering, and aerospace . The products include railway equipment, equipment for open pit and underground mining and transportation, metallurgical equipment, wind power equipment, construction machinery and chemical equipment. Capable of providing complete equipment sets and EPC solutions, it has exported products to more than 50 countries and regions.

1950 年
公司成立
Since 1950

493 万㎡
公司面积
Total area of 4.93 million square meters

10000+ 人
在岗员工
10000+ employees

500+ 亿
总资产
Total assets of RMB 50+ billion

QUALIFICATIONS AND CERTIFICATIONS
资质认证

- ●质量管理体系认证证书 — Quality Management System Certification Certificate
- ●环境管理体系认证证书 — Environmental Management System Certification Certificate
- ●职业健康安全管理体系认证证书 — Occupational Health And Safety Management System Certification Certificate
- ●实验室认可证书 — Laboratory Accreditation Certificate
- ●GL认证-TZFC3000B1 3MW — GL certification -TZFC3000B1 3MW
- ●风电机组低电压穿越能力评估证书 — Low voltage ride through capability appraisal certificate
- ●设计评估证书（TZ4500） — Certificate of Design Evaluation (TZ4500) / Certificate of Design Evaluation
- ●设计评估证书（TZFC5000C风力风电机组主齿轮箱） — (TZFC5000C wind turbine main gearbox)
- ●风电产品认证证书 — The Authentication Certificate of wind power product

EQUIPMENT PROFILE
装备简介


120t LF+VD 钢包精炼炉
120t LF+VD Ladle refining furnace


125MN自由锻造液压机
125MN Free forging hydraulic press


数控成形磨齿机群
CNC forming gear grinding machine group

4000+ 台
4000+Sets

各类主要生产设备
Many kinds of main production equipment

太重拥有冶炼、铸造、锻造、热处理、焊接、金属切削加工、产品组装、产品包装、起重运输等各类主要生产设备4000余台。

The company has more than 4000 sets of main production equipment, such as smelting, casting, forging, heat treatment, welding, metal cutting processing, product assembly, product packaging, lifting and transportation.

坚持“质量就是生命”原则，在对标先进的基础上，提高质量意识，强化全面质量管理，推广应用可靠性管理、6σ管理等先进方法，打造太重精品，以质量提升企业核心竞争力。

Adhere to the “quality is life” principle, on the basis of advanced standards, improve quality awareness, strengthen comprehensive quality and quantity management, promote the application of reliability management, 6σ Management and other advanced methods, to create TZ quality products, to enhance the core competitiveness of the enterprise.


风电齿轮箱齿轴柔性生产线
The geared shaft flexible production line of Wind turbine gearbox


风电齿轮箱热处理生产线
Heat treatment production line of wind turbine gearbox


风电齿轮箱箱体柔性生产线
The gearbox flexible production line of wind turbine gearbox


风电齿轮箱总装柔性线
Final assembly flexible production line of wind turbine gearbox


风力发电机组总装智能化柔性生产线
Final assembly inteligent flexible production line of wind turbine gearbox

EQUIPMENT CAPABILITY
装备制造能力

山西智能制造基地 Shanxi Intelligent Manufacturing Base

位于山西省太原市综改示范区，是世界上最先进的风电主机智能制造基地，配有全自动柔性焊接生产线、FMS机加工生产线、风力发电机组总装智能化柔性生产线；风电齿轮箱箱体柔性生产线、风电齿轮箱齿圈柔性生产线、风电齿轮箱盘齿柔性生产线、风电齿轮箱齿轴柔性生产线、风电齿轮箱热处理生产线、风电齿轮箱总装柔性线等，一期年生产能力500台套，二期建成后整个园区将实现年产风电齿轮箱及整机1000台套的能力。

It is located in the Comprehensive Reform Demonstration Zone of Taiyuan City, Shanxi Province, it is the world’ s most advanced intelligent manufacturing base for wind turbines. There are various production lines, such as those for automatic flexible welding production line, FMS machining production line, final assembly intelligent flexible production line, the gearbox flexible production line, the gear ring flexible production line, the plate teeth flexible production line, The geared shaft flexible production line and the heat treatment production line. The annual production capacity of phase Ⅰ is 500 sets and TZCO will achieve an annual production capacity of 1000 sets of wind energy gearbox and wind turbine generator upon completion of phase Ⅱ.

天津制造基地 Tianjin Manufacturing Base

位于天津港保税区，依托太重在天津滨海的大型吊装设备及重件码头等有利资源，主要生产5.XMW-10.XMW大功率海上风机，是公司大兆瓦级海上风电机组重要生产基地，也是国内唯一一家拥有重件码头的海上风电制造企业。

Located in Tianjin Port Free Trade Zone, relying on the favorable resources such as the large-scale hoisting equipment and heavy-duty wharf of Chongqing Heavy Machinery Co., Ltd in Tianjin Binhai, it mainly produces 5.XMW to 10.XMW high-power offshore wind turbine. It is an important production base for large-megawatt offshore wind turbine of the company and the only offshore wind turbine manufacturing enterprise with heavy-duty wharf in China.

内蒙制造基地 Inner Mongolia Manufacturing Base

位于乌兰察布市察哈尔右翼中旗辉腾锡勒大草原，占地面积30万平方米，配有风电机组总装厂、大型设备加工中心及热处理生产线等，可实现年产风电主机700台套、风机塔筒200套的能力。

Located in HuitengXile Grassland, Chahar Right Zhongqi, Wulanchabu City, covering an area of 300,000 square meters, the wind turbine assembly plant, large equipment processing center and heat treatment production line, etc., can achieve an annual output of 700 sets of wind turbine and 200 sets of fan tower.

NEW ENERGY FIELD
新能源领域

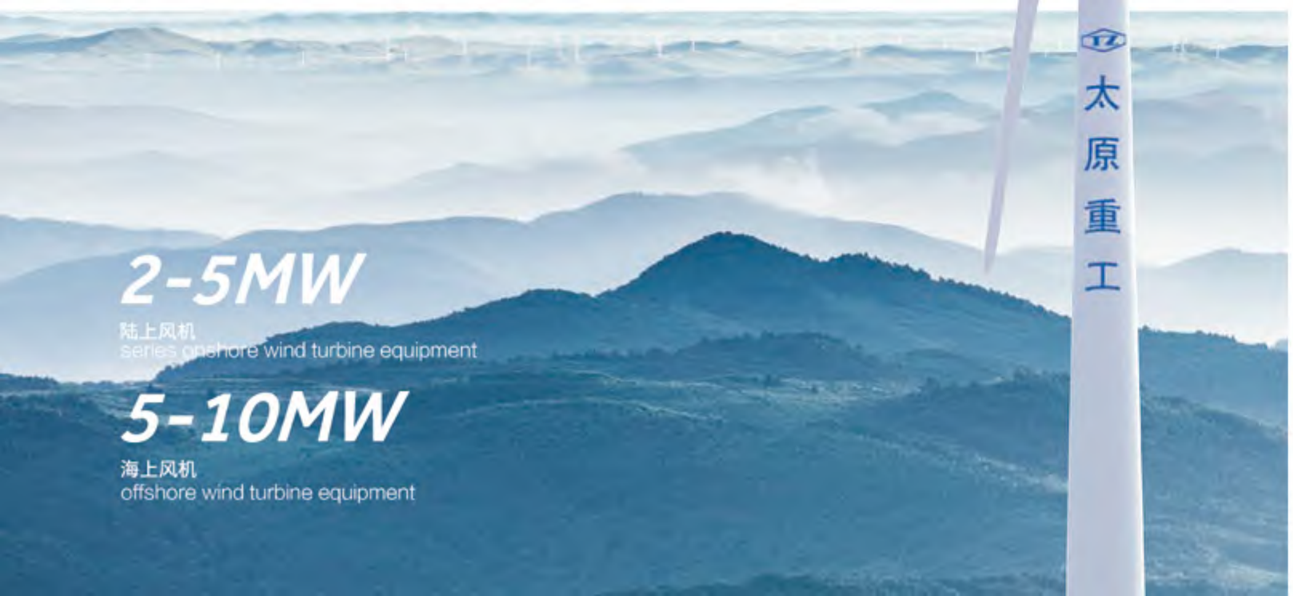
优化能源结构，引领绿色未来
Optimizing the energy structure, leading the green future

太重可为风电用户提供2.0-5MW系列陆上风力发电机组、5MW海上风力发电机组、风电齿轮箱、风机主轴、风电塔筒和钢桩，同时具备风场运维能力。重点研发了4MW以上陆上风力发电机组及10MW以上海上风力发电机组等系列化产品。

可为核电用户提供环形起重机、装卸料机、乏燃料起重机等。海上核动力平台反应堆压力容器正在研制。

TZCO can produce 2.0-5MW series of onshore wind turbine generator set and 5MW offshore wind turbine generator set, wind turbine gear boxes, fan main shafts, wind vane tower barrel, piling bar and TZCO has the wind field operation and maintenance ability. TZCO also focused on the research and development of above 4MW onshore wind turbines and above 10MW offshore wind turbines and other series of products.

We can provide nuclear power users with equipment like circular cranes, refueling machines, and spent fuel cranes. Reactor pressure vessels for offshore nuclear plants are being developed.



风力发电机组
Wind Turbine Generator

产品概述Product overview

公司自主研制1.5MW、2MW、2.5MW、3.6MW、4.XMW双馈机型风力发电机组及3.XMW、5.XMW、8MW、10MW永磁机型风力发电机组系列产品。已投入使用的产品有双馈型1.5MW、2.0MW、2.5MW风力发电机组及全功率高速永磁型3.0MW、5.0MW风力发电机组，适用于高温、低温、内陆、沿海、潮间带、海上、高海拔、低风速等不同的风资源地区，并可根据风电场风资源情况匹配不同的风轮直径和轮毂高度。

TZCO has independently developed 1.5MW, 2MW, 2.5MW, 3.6MW, 4 XMW doubly-fed wind turbine sets and 3XMW, 5XMW, 8 MW,10MW permanent magnet type wind turbine series products. Doubly fed wind turbine generators(1.5MW, 2.0MW, 2.5MW) and high-speed permanent magnet-driving wind turbines (3.0MW and 5.0MW) have been in operation, it is suitable for high temperature, low temperature, inland, coastal, intertidal zone, offshore, high altitude, low wind speed and other different wind resource areas. Diameters and hub heights of turbines can be adjusted in accordance with wind resources of a wind farm.

执行标准Product standard

公司新能源产品对标国际一流，执行IEC61400及DNV-GL国际标准，并进行权威认证。

The company' s new energy products to the international first-class as the goal, implement the international standards of IEC61400 and DNV-GL and carry out authoritative certification.

风力发电机组主要执行标准：

Implemented standards for wind generator set

1.《IEC 61400-1:2019 Wind energy generation systems - Part 1: Design requirements》

2.《IEC 61400-3-1:2019 Wind energy generation systems - Part 3-1: Design requirements for fixed offshore wind turbines》

3.《GL2010 Guideline for the Certification of Wind Turbines》

4.《GL2012 Guideline for the Certification of Offshore Wind Turbines》

性能特点 The performance characteristics

3.6MW风力发电机组

3.6MW wind turbine generator

》》》 采用成熟可靠的双主轴承四点支撑结构，主要承载构件经过拓扑优化，载荷传递清晰。

The mature and reliable four-point support structure of double main bearings is adopted. The main load-bearing components are topologically optimized, and the load transmission is clear.

》》》 机舱采用紧凑型设计理念，降低机舱高度、实现机舱整体发运，降低发运成本。

The cabin adopts the compact design concept, which reduces the cabin height, realizes the overall cabin delivery, and reduces the shipping cost.

》》》 对轮毂结构进行优化、冗余设计，增加轮毂冷却系统设计方案及变桨驱动冗余设计方案。

Hub structure is upgraded and redundant designs included . Design for hub cooling system and redundancy design of variable propeller are added.

》》》 优化前后机架结构形式，提高强度、降低重量。

The front and rear frame structure are upgraded to improve strength and reduce weight.

4.XMW风力发电机组

4.XMW wind turbine generator

》》》 采用双馈技术路线，35KV变压器、变流器上置，降低电缆成本，提升施工效率；

Adopt double-fed technology route, 35KV transformer and converter are installed to reduce cable cost and improve construction efficiency;

》》》 技术可靠、配套产业链成熟、测试及试验体系完善；

There are reliable technology, mature supporting industry chains, and sound test system;

》》》 采用TRB+TRB配套集成式轴承座布置形式，承载力强；

It has strong bearing capacity with TRB+TRB integrated bearing housing;

》》》 传动效率高、控制技术先进；

It boasts high transmission efficiency and advanced control technology;

》》》 高防护等级设计，广泛适用于多种复杂环境；

Protection design make it widely applicable to the complex environment;

》》》 平台化、模块化设计，根据风资源情况灵活组合功率、风轮直径、塔筒高度，适用于多种风资源区；

Modular design is available in accordance with local wind resources ,which includes flexible choices for equipment of different power, wind wheel diameter, tower cylinder height ;

》》》 模块化设计，可实现机舱分体、整体运输和吊装，降低建设成本。

Modular design, can realize the engine room split, the whole transportation and hoisting, reduce the construction cost.

5.X、8.X、10.XMW风力发电机组

5.X, 8.X, 10.XMW wind turbine generator

》》》 单机容量更大、度电成本更低；

It has larger single machine capacity and lower cost per kilowatt hour;

》》》 紧凑型传动链结构先进、升级空间大，是未来大兆瓦机型风力发电机组发展方向；

In the future, the development direction of large megawatt type wind turbine is advanced structure of compact transmission chain and large space for upgrading.

》》》 机舱尺寸小、重量轻，经济性好、易于运输和吊装；

The engine room is economical , small in size and light in weight and easy to transport and lift;

》》》 传动链刚性好，齿轮箱、发电机受力清晰，可靠性高；

There are transmission chains with robust quality and well distributed loading for gearbox and generator;

》》》 控制系统配备传动链加阻控制、塔筒加阻控制、推力消减控制、弹性功率控制、停机软切出控制、桨距角自寻优控制、偏航大偏角穿越控制等先进技术。

The control system is equipped with advanced technologies such as transmission chain resistance control, tower drum resistance control, thrust reduction control, elastic power control, soft cut out control, pitch Angle self-optimization control and yaw large deviation through control and so on.

性能参数Performance Parameter

序号 Item	产品型号 Product model	单位 unit	TZF3600	TZF3600	TZF4X00	TZF5X00	TZF8000	TZF10000
1	额定功率 Rated power	kW	3600	3600	4500	5600	8000	10000
2	风轮直径 Rotor diameter	m	140	146	155 / 160	171	178 / 192	185 / 210
3	切入风速 cut-in wind speed	m/s	3	3	3	3	3	3
4	额定风速 rated wind speed	m/s	9.9	9.3	10	10	11.3	11.6
5	切出风速（10 分钟平均值） Cut out wind speed (10 min average)	m/s	25	25	25	25	25	25
6	极端（生存）风速 (3s 最大值) Extreme (survival) wind speed (3s maximum)	m/s	52.5	52.5	59.5	52.5	70	70
7	生存环境温度 Living environment temperature	℃	常温型：-20 ~ +50 低温型：-40 ~ +50 Low temperature type: -40 ~ +50				常温型 normal temperature type	常温型 normal temperature type
8	运行环境温度 Operating ambient temperature	℃	常温型：-10 ~ +40 低温型：-30 ~ +40 Low temperature type: -30 ~ +40				常温型 normal temperature type	常温型 normal temperature type
9	设计寿命 Design life	年 year	20	20	20	20	25	25
10	设备平均可利用率 Average availability of equipment		≥ 99%	≥ 99%	≥ 99%	≥ 99%	≥ 99%	≥ 99%
11	适合安装风区 Suitable for installation of wind area		IEC III	IEC III	S	S	IEC IB+TII	IEC IB+TII

风电塔筒
Wind Vane Tower Barrel

产品概述Product overview

为更好地适应市场需求，更加集约高效地利用现有资源，公司在内蒙古设立塔筒制造基地，具备年产风机塔筒200套，总重约5万吨的生产能力。

To meet market demand and make more intensive and efficient use of existing resources, TZCO has built a tower cylinder manufacturing base in Inner Mongolia. It is capable of producing 200 sets of cylinders weighting about 50,000 tons annually

风电齿轮箱
Wind Energy Gearbox

公司先后与德国连科（RENK）公司、英国诺迈士（Romax）公司进行1.5-10.XMW风电齿轮箱技术研发和生产制造的合作。

The TZCO has successively cooperated with RENk (Germany) Company and Romax (UK) Company for technology research and development and manufacturing of 1.5-10.XMW Wind Energy Gearbox.

1.5MW-10.XMW风电齿轮箱
1.5MW-10.XMW Wind Energy Gearbox.

产品概述 Product Overview

风电齿轮箱产品涵盖1.5MW-10.XMW双馈及半直驱机型；主要结构有一级行星+两级平行轴、两级行星+一级平行轴、两级行星、内齿圈驱动NW型、三级行星传动等多重种结构；适用于高原型、平原型、海上等类型风场。

The wind energy gearbox products cover 1.5MW-10.XMW doubly-fed and semi-direct drive models. The main structure has the first stage planet + two stage parallel axis, two stage planet + one stage parallel axis, two stage planet, inner gear ring drive NW type, three stage planetary transmission and other multiple structures; It is suitable for wind field of plateau type, plain type and sea type.

性能特点 Performance Characteristic

标准化 Standardized Design

采用标准化、模块化设计方式

Standardized and modular design

结构先进 Advanced Structure

4.XMW以下机型主要采用两级行星+一级平行轴、内齿圈驱动NW型；5.XMW、8.XMW、10.XMW机型采用三级行星传动结构，取消了低速端联轴器，将齿轮箱直接与主轴集成，缩短传动链长度，齿轮箱重量大幅度减重。

For models other than 4.XMW, two stage planet + one stage parallel axis, inner ring gear drive NW type are applied. Models like 5.XMW, 8.XMW, 10.XMW adopt three-stage planetary transmission structure without low-speed couplings. The gearbox is directly integrated with the spindle to reduce length of transmission chains and the weight of the gearbox has been greatly reduced.

质量可靠 Reliable Quality

采用三级行星传动结构，风电齿轮箱零部件规格一致，零部件精度更容易保证；电机与齿轮箱二级箱体集成，缩短传动链长度，提高系统稳定性。

The three-stage planetary transmission structure is adopted, and Wind energy gearbox parts specifications are consistent, it is easier to ensure the precision. The motor is integrated with the secondary gearbox to shorten the length of transmission chain and improve system stability.

成本低 Low Cost

采用三级行星传动结构，速比76，电机转速600rpm，电机重量轻、成本低。

Three-stage planetary transmission structure is available with speed ratio of speed ratio 76, motor speed 600rpm. It has light weight of the motor and low cost.

性能参数Performance Parameter

2.5MW NW型风电齿轮箱
2.5MW NW Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	内齿圈驱动 NW 型行星传动 The Internal gear drives(NW planetary transmission)
叶轮直径 (m) impeller diameter	133/143
齿轮箱额定功率 (kW) Gear box power rating	2878
额定输入转速 (r/min) Rated input speed	11.5/11.05
额定输入扭矩 (kN · m) Rated input torque	2311/2487
传动比 Transmission ratio	103.67/108.6
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling way	风冷 / 水冷 Air cooling / Water cooling
输入轴联接方式 Connection mode of input shaft	锁紧盘 Locking plate
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

3MW 一级行星半直驱风电齿轮箱
3MW Single-planet and Semi-direct Drive Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	一级行星 + 一级平行轴齿轮传动 First-stage planetary and one-stage parallel shaf
叶轮直径 (m) impeller diameter	122
齿轮箱额定功率 (kW) Gear box power rating	3300
额定输入转速 (r/min) Rated input speed	13.2
额定输入扭矩 (kN · m) Rated input torque	2387
传动比 Transmission ratio	26.3
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling way	风冷 Air cooling
输入轴联接方式 Connection mode of input shaft	锁紧盘 Locking plate
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

3MW 两级行星风电齿轮箱
3MW Dual Planetary Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	两级行星 + 一级平行轴齿轮传动 Two - stage planetary and one - stage parallel shaft
叶轮直径 (m) impeller diameter	146
齿轮箱额定功率 (kW) Gear box power rating	3371
额定输入转速 (r/min) Rated input speed	10.9
额定输入扭矩 (kN · m) Rated input torque	2954
传动比 Transmission ratio	160.14
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling way	风冷 Air cooling
输入轴联接方式 Connection mode of input shaft	锁紧盘 Locking plate
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

3.6MW 一级行星半直驱风电齿轮箱
3.6MW Single-planet and Semi-direct Drive Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	一级行星 + 一级平行轴齿轮传动一级行星 + 一级平行轴齿轮传动 One-stage planetary and one-stage parallel shaft
叶轮直径 (m) impeller diameter	115
齿轮箱额定功率 (kW) Gear box power rating	3960
额定输入转速 (r/min) Rated input speed	13.2
额定输入扭矩 (kN · m) Rated input torque	2865
传动比 Transmission ratio	26.53
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling way	风冷 Air cooling
输入轴联接方式 Connection mode of input shaft	锁紧盘 Locking plate
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

4.XMW 两级行星风电齿轮箱
4.XMW Dual-planet Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	两级行星 + 一级平行轴齿轮传动 Two - stage planetary + one - stage parallel shaft gear transmission
叶轮直径 (m) impeller diameter	155 / 160
齿轮箱额定功率 (kW) Gear box power rating	≥ 5131
额定输入转速 (r/min) Rated input speed	9.5 ~ 10
额定输入扭矩 (kN · m) Rated input torque	4900
传动比 Transmission ratio	130 ~ 170
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 Forced lubrication
冷却方式 Cooling way	风冷 Air cooling
输入轴联接方式 Connection mode of input shaft	法兰 Flange
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

5MW NW型风电齿轮箱
5MW NW Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	内齿圈驱动 NW 型行星传动 The inner ring gear drives the NW type planetary transmission
叶轮直径 (m) impeller diameter	126/128/154
齿轮箱额定功率 (kW) Gear box power rating	5500/5800/5950
额定输入转速 (r/min) Rated input speed	12/11.9/10.1
额定输入扭矩 (kN · m) Rated input torque	4377/4654/5625
传动比 Transmission ratio	47.922/102.426/90.039
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling way	水冷 Water cooling
输入轴联接方式 Connection mode of input shaft	法兰 Flange
工作环境温度 (℃) Operating ambient temperature	-10 ~ +40
生存环境温度 (℃) Living environment temperature	-20 ~ +50
设计寿命 designed life	20 年 Years

5.XMW 三级行星风电齿轮箱
5.XMW Three Planetary Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox structure type	三级行星齿轮传动 Three-stage planetary gear transmission
叶轮直径 (m) impeller diameter	171
齿轮箱额定功率 (kW) Gear box power rating	6344
额定输入转速 (r/min) Rated input speed	9.0 ~ 9.5
额定输入扭矩 (kN · m) Rated input torque	6377
传动比 Transmission ratio	66 ~ 76
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察）Spindle steering (viewed from blade side)	顺时针 Clockwise
润滑方式 lubrication way	强制润滑 Forced lubrication
冷却方式 Cooling way	风冷 + 水冷 Wind cooling +Water cooling
输入轴联接方式 Connection mode of input shaft	法兰 Flange
工作环境温度 (℃) Operating ambient temperature	-30 ~ +40
生存环境温度 (℃) Living environment temperature	-40 ~ +50
设计寿命 designed life	20 年 Years

8.XMW 三级行星风电齿轮箱
8.XMW Three Planetary Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox Structure Type	三级行星齿轮传动 Three planetary gear transmission
叶轮直径 (m) Impeller Diameter (m)	178/192
齿轮箱额定功率 (kW)Gear box rated power (kW) 8000	8980
额定输入转速 (r/min)Rated input speed (r/min)	9.5 ~ 10.8
额定输入扭矩 (kN · m) Rated input torque (kN · m)	7941
传动比 Transmission ratio	63.2/64.8
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察） The spindle turns (as seen from the blade side)	顺时针 Clockwise
润滑方式 Lubrication mode	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling mode	风冷 + 水冷 Air cooling + Water cooling
输入轴联接方式 input shaft connection mode	法兰 Flange
工作环境温度 (℃) Working environment temperature	-10 ~ +40
生存环境温度 (℃)Living environment temperature	-20 ~ +50
设计寿命 The design life	25 年 Years

10.XMW 三级行星风电齿轮箱
10.XMW Three Planetary Wind Energy Gearbox

技术参数 Technical parameters	
齿轮箱结构型式 Gearbox Structure Type	三级行星齿轮传动 Three planetary gear transmission
叶轮直径 (m) Impeller Diameter (m)	185/210
齿轮箱额定功率 (kW) Gear box rated power (kW) 8000	11225
额定输入转速 (r/min)Rated input speed (r/min)	9.0 ~ 9.5
额定输入扭矩 (kN · m) Rated input torque (kN · m)	11284
传动比 Transmission ratio	63 ~ 77
机械效率 Mechanical efficiency	≥ 97%
主轴转向（从叶片侧观察） The spindle turns (as seen from the blade side)	顺时针 Clockwise
润滑方式 Lubrication mode	强制润滑 + 飞溅润滑 Forced lubrication + Splash lubrication
冷却方式 Cooling mode	风冷 + 水冷 Air cooling + Water cooling
输入轴联接方式 input shaft connection mode	法兰 Flange
工作环境温度 (℃) Working environment temperature	-10 ~ +40
生存环境温度 (℃)Living environment temperature	-20 ~ +50
设计寿命 The design life	25 年 Years

偏航、变桨齿轮箱
YAW & PITCH DRIVE GEARBOX

产品概述 Product Overview

公司偏航、变桨齿轮箱产品涵盖
1.5MW、2.0MW、2.5MW、3.0MW、3.6MW、4.XMW、5.XMW主机机型，正在研制8.XMW、10.XMW机型配套产品。

Yaw & pitch drive gearboxes include models of 1.5MW, 2.0MW, 2.5MW, 3.0MW, 3.6MW, 4.XMW and 5.XMW . The supporting products of 8.XMW and 10.XMW is being developed.

性能特点

Performance Characteristics

结构紧凑、重量轻、响应速度快、运行稳定可靠。

They are known for compact structure , light weight, fast response speed, and stable and reliable operation.

技术参数：Technical parameters

偏航齿轮箱技术参数 Technical parameters of yaw gearbox			
偏航齿轮箱型号 model of yaw gearbox	额定输出扭矩 /Nm rated output torque/Nm	静态输出扭矩 /Nm static output torque/Nm	速比 speed ratio
1.5MW(JFP015.02.00)	18284	69016	1110.3
2.0MW(JFP020.01.00)	33780	108000	1656
5MW(JFP050.01.00)	67400	171450	1969.6

变桨齿轮箱技术参数 Technical parameters of variable propeller gearbox			
变桨齿轮箱型号 model of pitch gearbox	额定输出扭矩 /Nm rated output torque/Nm	静态输出扭矩 /Nm static output torque/Nm	速比 speed ratio
1.5MW(JFB015.01.00)	6430	13750	130.7
2.0MW(JFB020.01.00)	9600	18500	162
5MW(JFB050.01.00)	23490	76000	205.6

风机主轴
Main Shaft of Wind Turbine Equipment

年产风机主轴

1200 支的能力 pcs

公司是国内最早生产风机主轴的厂家之一，拥有从冶炼、锻造、热处理、检验、精加工、涂装、包装在内所有工序闭环制造能力，按照西门子审核要求，高标准设计建造专业化风机主轴精加工生产线，可生产6MW及以下风机主轴，年生产能力1200支。

TZCO is one of the earliest manufacturer of fan main shaft, from smelting, forging, heat treatment, inspection, finishing, painting, packaging, all process closed loop manufacturing capacity, according to the Siemens audit request, high standard design building dedicated fan main shaft finishing production lines, can produce under 6 MW and fan main shaft, annual production capacity of 1200 .

3.6MW风机主轴
3.6 MW Main shaft of wind turbine equipment

5.0MW风机主轴
5.0 MW Main shaft of wind turbine equipment

4.0MW风机主轴
4.0 MW Main shaft of wind turbine equipment

2.3MW风机主轴
2.3 MW Main shaft of wind turbine equipment

运维服务
OPERATION AND MAINTENANCE SERVICES

公司整合资源优势，打造专业化的运维团队，为用户提供陆上及海上全系列风电机组的技术支持、运行维护、备件供应一体化全生命周期服务。 建立全区域覆盖的运维网络，形成专业运维人员急速响应、快速进驻现场，确保用户24小时零等待的专业高速服务模式，为用户实现风场运行效益和价值的最大化。

The company integrates resource advantages, builds a professional operation and maintenance team, and provides users with the full life cycle service of technical support, operation and maintenance, and spare parts supply for all onshore and offshore wind turbines. Establish the operation and maintenance network covering the whole region, form the professional operation and maintenance personnel to respond quickly, enter the site quickly, ensure the user 24 hours without waiting for the professional high-speed service mode, for the user to realize the wind farm operation benefit and value maximization.

服务内容 Contents

风电机组运维：Operation and maintenance of wind turbines

风资源评估、微观选址、发电量测算及技术咨询与指导。

Wind resource assessment, micro site selection, power generation calculation and technical consultation and guidance.

风电机组安装、调试及验收及技术咨询与指导。

Wind turbine installation, commissioning and acceptance and technical advice and guidance.

风电机组运行数据分析、故障诊断、维护维修及技术升级与改造。

Wind turbine operation data analysis, fault diagnosis, maintenance and technical upgrading and transformation.

风电机组零部件振动、温升、噪声监测诊断及故障处理。

Vibration, temperature rise, noise monitoring, diagnosis and fault treatment of wind turbine components.

风电机组运行耗材、备件损耗分析及供应。

Analysis and supply of consumables and spare parts of wind turbine operation.

风场运行数据分析、升级改造及运行管理咨询与服务。

Wind farm operation data analysis, upgrading and transformation, operation management consulting and services.

风电齿轮箱运维：Operation and maintenance of wind power gearbox:

故障诊断 噪声诊断、内窥镜检查、振动监测、油品检测与分析。

Fault diagnosis: noise diagnosis, endoscopy, vibration monitoring, oil detection and analysis.

塔上维护 齿面光整、轴系更换、箱体轴承孔磨损修复、润滑管路、冷却系统、过滤系统、电子元器件等零部件进行更换。

The tower maintenance : Tooth surface finishing, shafting replacement, box bearing hole wear repair, lubrication pipeline, cooling system, filtration system, electronic components and other parts for replacement.

返厂维修 满足齿轮箱原参数设计，同时适应风场实际需求的参数升级改造。

Return to the factory for maintenance: meet the original parameter design of the gearbox, and to adapt to the actual demand of the wind field parameter upgrading and transformation.

运维培训 齿轮箱维护规程、常见故障及解决方案、现场故障诊断及处理。

Operation and maintenance training: gear box maintenance procedures, common faults and solutions, on-site fault diagnosis and treatment.