



MINGYANG WIND POWER

PERFORMANCE BY NATURE



Mingyang 1.5MW Series Wind Turbine Generator
High Output Wind Turbine Generator

Ming Yang Wind Power Industry Group

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Product Introduction

The MY 1.5 Series Wind Turbine Generator was jointly developed by Germanischer Lloyd and Mingyang Wind Power. With more than 50 years of combined experience in electrical and wind turbine design, Germanischer Lloyd's issuing team verified elementally the quality of the MY 1.5 Series Wind Turbine Generator. Germanischer Lloyd's issuing team verified elementally the quality of the MY 1.5 Series Wind Turbine Generator second to none. The MY 1.5 MW WTG is designed to operate in extreme conditions.



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Main Features

- An up wind, three blades, independent electrical pitch control, double-fed variable-speed wind turbine generator.
- Offering multiple platforms like the MY1.5s (Typhoon Rated withstanding winds up to 70ms); MY1.5se (Cold Weather Design operating in temperatures to -30°C); MY1.5Su (withstanding extreme low temperature to -45°C) and MY1.5Sh (high elevation altitude design operating above 4000m) allows our customer to apply renewable energy solutions to all climactic conditions.
- Specially designed blade characteristics optimize turbine performance in all wind régimes. The 1.5s typhoon rated wind turbine uses a 37.5m blade while the 1.5se cold weather design uses a 40.3m blade. The 1.5 Series Wind Turbine out performs others up to 10% meaning more generated power for your investment.
- The two bearing design offers a more robust platform to reduce the gearbox wear due to unplanned thrust and impact loads. Protecting the gearbox means more performance and life to the investment.
- Ming Yang Wind Power's commitment to quality is second to none. Rigorous testing criteria goes in to every machine we sell. Each machine is load tested before leaving our factory by our top engineers. The result is superior performance at the customers site.
- A hermetically sealed nacelle option protects vital parts from corrosion and wear. Increasing the pressure in the nacelle above ambient keeps elemental concerns outside the machine allowing for longer life and better performance.

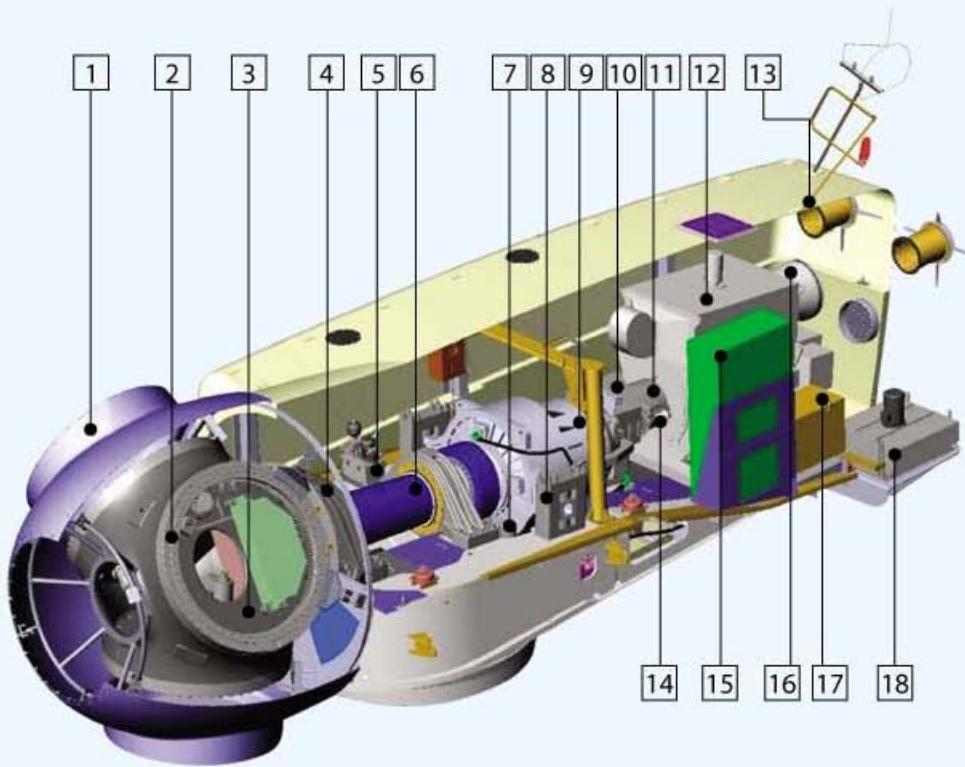


The Mingyang wind turbines were installed and put into operation at Zhanjiang Xuwen, Damaoqi, Duolun, Tieling, Xiangyang, Shangdu, Jiamusi, Dangxiaogou wind farms etc, moreover, two of Mingyang wind turbines have connected to the grid successfully at China's first offshore wind farm which located in intertidal zone.

by pioneers in the electric and wind turbine sectors Mingyang Electric and aerodyn Energiesysteme GmbH in 2007. With more design great care was taken to ensure that utmost quality and attention went into every detail of the MY 1.5 Series Wind Turbine at all components in the design of today's MY 1.5 MW WTG were in complete compliance. The result is performance and quality in all wind regimes and delivery unparalleled output in all wind régimes.

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Wind Turbine Structure

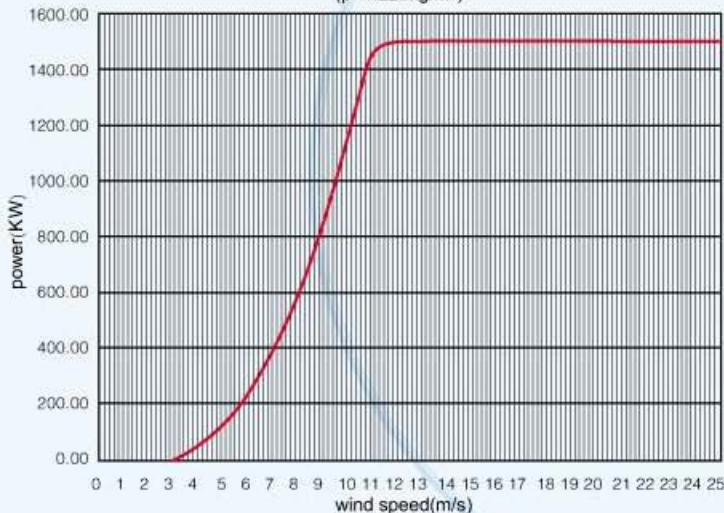


- 1 Hubcap
- 2 Pitch Bearing
- 3 Rotor Hub
- 4 Bearing Housing
- 5 Hydraulic Station
- 6 Main Shaft
- 7 Nacelle Crane
- 8 Gearbox Support Frame
- 9 Gearbox
- 10 Hydraulic Brake Assembly
- 11 Shaft Coupling
- 12 Generator
- 13 Weather Mast
- 14 Slip Ring System
- 15 Control Cabinet
- 16 Generator Cooling Fan
- 17 Transformer
- 18 Water Cooler

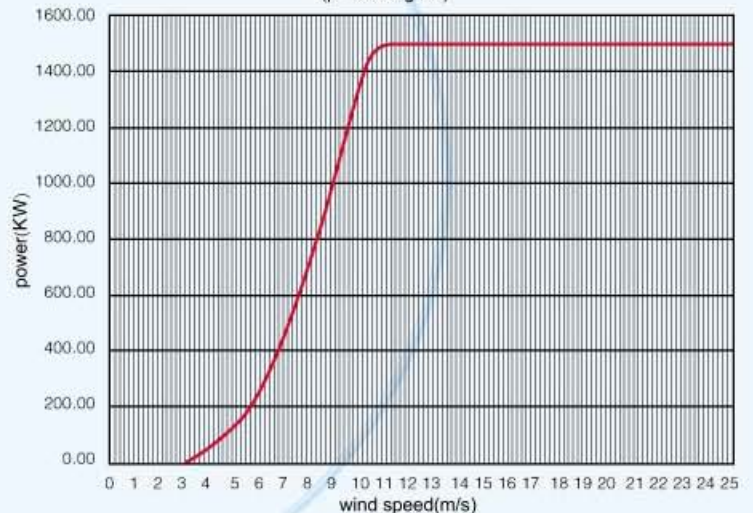
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Wind Turbine Power Curve

MY1.5 / 77 power curve
($\rho=1.225\text{kg/m}^3$)



MY1.5 / 82 power curve
($\rho=1.225\text{kg/m}^3$)



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Main Data

Description	Unit	Specifications	
		MY1.5Se	MY1.5s
Unit data			
Rated power	kW	1500	
Rotor diameter	m	77.1 / 82.6	
Cut-in wind speed	m/s	3	
Cut-out wind speed	m/s	25	
Rated wind speed	m/s	11.3 / 10.8	
Survival wind speed	m/s	59.5 / 70	
Design type class		IEC TC3A+(TCII extreme wind speeds) IEC TC2A+(TCI extreme wind speeds)	
Designed operation time	yr	20	
Rotor and blade			
Length of blade	m	aeroBlade37.5、SHFRP37.5 AeroBlade40.3、SINOMA40.2	
Blade material		Glass fiber reinforced resin	
Blade rotational speed	rpm	9.7~19.5	
Rated rotor rotational speed	rpm	17.4	
Rotor axis inclination		5°	
Rotor blade cone angle		3.5°	
Rotor position related to tower		Up wind	
Swept area	m ²	4368/5320	
Gearbox			
Type		2 stages planetary gear and 1 stage parallel axis	
Rated power	kW	1663	
Ratio		50Hz:100.48 / 60Hz:83.04	
Generator			
Type		Double fed asynchronous generators	
Rated power	kW	1550	
Rated input torque	kNm	8.741	
Rated voltage	v	690	
Rated current	A	1169	
Rated speed	rpm	1753	
Nominal frequency	Hz	50 / 60	
Insulation level		F	
Protection level		IP54	
Braking system			
Main braking system		Pitch independent braking	
The second braking system		The single disc type, failures security	
Pitch system			
Type		Electrical drive	
Pitch bearing type		4 contact double-ball bearing	
Control system			
Control cabinet		Ming Yang / Beckhoff	
Inverter		IGBT bidirectional inversion	
Rated output power factor	CosΦ	± 0.95	
Lightning protection			
Design standards		In terms of IEC61400-24-1; complying with GL	
Lightning-proof measures		Electrical grounding, blade tip and middle meet dodges	
Grounding resistance	Ω	≤4	
Tower			
Type (classified according to the ambient temperature)		Tubular, made of steel (a lifting rack and protection against falling inside)	
Height	m	65 / 70 / 75 / 80	
Surface anticorrosion		Spray printing	
Weight			
Main nacelle	ton	65	
Rotor	ton	35	
Survival and Operation temperature			
MY1.5Se	°C	- 40~+50 (Survival) - 30~+40 (Operation)	
MY1.5S	°C	- 20~+50(Survival) - 10~+40(Operation)	
Average temperature	°C	0 /20	
Seismic intensity		VII	
Installation elevation altitude	m	2000	

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Main Data

Description	Unit	Specifications	
		MY1.5Su	MY1.5Sh
Unit data			
Rated power	kW	1500	
Rotor diameter	m	77.1 / 82.6	82.6
Cut-in wind speed	m/s	3	
Cut-out wind speed	m/s	25	
Rated wind speed	m/s	11.3 / 10.8	14
Survival wind speed	m/s	59.5 / 70	59.5
Design type class		IEC TC3A+(TCII extreme wind speeds)	
		IEC TC2A+(TCI extreme wind speeds)	
Designed operation time	yr	20	
Rotor and blade			
Length of blade	m	aeroBlade37.5、SHFRP37.5 AeroBlade40.3、SINOMA40.2	40.25
Blade material		Glass fiber reinforced resin	
Blade rotational speed	rpm	9.7~19.5	
Rated rotor rotational speed	rpm	17.4	
Rotor axis inclination		5°	
Rotor blade cone angle		3.5°	
Rotor position related to tower		Up wind	
Swept area	m ²	4368/5320	5320
Gearbox			
Type		2 stages planetary gear and 1 stage parallel axis	
Rated power	kW	1663	
Ratio		50Hz:100.48 / 60Hz:83.04	
Generator			
Type		Double fed asynchronous generators	
Rated power	kW	1550	
Rated input torque	kNm	8.741	
Rated voltage	v	690	
Rated current	A	1169	
Rated speed	rpm	1753	
Nominal frequency	Hz	50 / 60	
Insulation level		F	
Protection level		IP54	
Braking system			
Main braking system		Pitch independent braking	
The second braking system		The single disc type, failures security	
Pitch system			
Type		Electrical drive	
Pitch bearing type		4 contact double-ball bearing	
Control system			
Control cabinet		Ming Yang / Beckhoff	
Inverter		IGBT bidirectional inversion	
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Tower			
Type (classified according to the ambient temperature)		Tubular, made of steel (a lifting rack and protection against falling inside)	
Height	m	65 / 70 / 75 / 80	
Surface anticorrosion		Spray printing	
Weight			
Main nacelle	ton	65	
Rotor	ton	35	
Survival and Operation temperature			
MY1.5Su	℃	- 45~+50 (Survival)	
		- 40~+40 (Operation)	
MY1.5Sh	℃	- 40~+50(Survival)	
		- 30~+40(Operation)	
Average temperature	℃	0 / 5-15	
Seismic intensity		VII	
Installation elevation altitude	m	2000 / 2000-4000	



Although the wind power industry develops at a fast pace, low average wind speed and high maximum wind speed in many regions around world makes it difficult to choose a suitable type for all those different conditions. Besides, low utilization hour of most wind turbines causes high electricity cost from wind power generation.

The MY1.5MW series wind turbines are specially optimized to answer these challenges. Large diameter rotor increases the wind swept areas, which in turn improves power output even under low wind speed. Reinforcement of certain components enables the MY1.5MW Series wind turbines to have higher equivalent utilization hours, and it can survive and perform well even under complex climate conditions. The MY1.5MW Series wind turbine aims at market for turbines suitable for lower average wind speed and high maximum wind speed. We are striving to provide high quality, high efficiency, and high return wind turbines for domestic and international wind power operators.

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