7 PRIEDAS

Vėjo elektrinių modelių pagrindiniai techniniai parametrai

_ 01 07
AT A GLANCE

175 M
ROTOR

SINGLE-PIECE BLADE

+15% SWEPT AREA COMPARED TO N163/6.X

+22%

MORE YIELD

IN LOW-WIND CONDITIONS COMPARED TO N163/5.X & N163/6.X

106.0
DB(A)

AT 6.22 MW

SOUND, POWER & LOAD-OPTIMIZED MODES

_ 02 07
THE SPECIALIST FOR LOW-WIND SITES

PROVEN TECHNOLOGY. MAXIMIZED YIELD.

The Nordex Group is once again expanding its globally successful Delta4000 platform with a new highly-efficient wind turbine: the N175/6.X – Nordex' specialist for light-wind speeds. At typical low to medium-wind locations, the N175/6.X will achieve between 7 and 14 percent more yield compared to its sister models, the N163/5.X and N163/6.X due to its single-piece, newly-designed 85.7-meter-long rotor blade and its above-average capacity factor. This additional yield is achieved particularly during times of lighter wind speeds with the turbine producing up to 22 percent more energy than its predecessors.

As part of the Delta4000 series, the high flexibility of site-dependent power modes are also applied to the N175/6.X, thus providing a wider range of options for increased suitability in terms of sound, load and power. The turbine can also be equipped with a bat module and on-demand night-time marking. A cold climate variant ensuring operation in environments of -30°C is also available. The turbine is designed with an operational lifetime of 25 years, but will be able to reach 35 years depending on the site conditions.

_ 03 07
OPTIMIZED DESIGN BASED ON PROVEN TECHNOLOGY

As of October 2022

YEARS OF EXPERIENCE & PROVEN CONCEPTS

The N175/6.X uses the proven technical concepts of the Delta4000 series, such as the control system, the flexible rated power, and large parts of the nacelle of its sister model, the N163/6.X, which has already been tested in the field. As a result, already tested and existing suppliers and production capacities can also be used for the new turbine.

_ 04 07
TECHNICAL DATA

Operating data

Rated power
6.0-6.X

Cut-in wind speed
3 m/s

Cut-out wind speed
20 m/s

Rotor

Diameter
175 m

Swept area
24,053 m2

Gearbox

Type
High-speed gearbox

Generator

Construction
Double-fed asynchronous generator

Cooling system
Liquid/air cooling

Grid frequency
50/60 Hz

Brake system

Main brake
Aerodynamic brake (pitch)

Holding brake
Disc brake

Hub height

Hub height
Up to 179m, project and site-specific

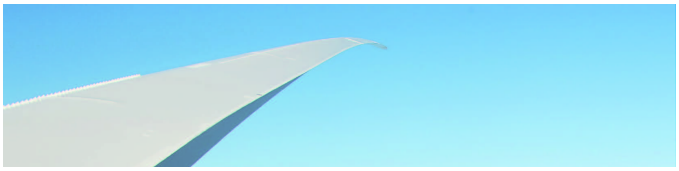
_05 07 THE STRATEGY- EVOLUTIONARY

OPTIMIZED DESIGN FOR LOW-WIND SITES BASED ON PROVEN TECHNOLOGY

The Delta4000 platform is successful in many markets all over the world. Using the best features of this platform and optimizing the power curve for low and medium-wind sites, the N175/6.X was born. Its flexibility and availability of project-specific optimizations will also be key factors of our new turbine.
This is advantageous for operators, as electricity prices are usually higher during low-wind periods and the N175/6.X ensures high electricity production already at low wind speeds. Therefore, this new turbine is a perfect complement to our existing products.

1. LARGER ROTOR DIMENSIONS
2. RE-USE OF ELECTRICAL SYSTEM
3. RELIABLE DRIVETRAIN CONCEPT
4. FLEXIBLE POWER MODES FOR OPTIMIZED SUITABILITY
5. GRID COMPATIBILITY GUARANTEED

_06 07 MORE ABOUT THE DELTA4000



Siemens Gamesa
Enhanced performance

SIEMENS Gamesa
RENEWABLE ENERGY

Flexible power output and two rotor sizes to enhance performance at any sites

Siemens Gamesa turbines created to deliver a competitive value proposition for our customers

Siemens Gamesa, your technology partner

At Siemens Gamesa, we strive to anticipate opportunities in an increasingly demanding market. Our wind technology expertise, backed by more than 40 years of experience and over 136 GW installed throughout the world, equips us with the right tools for providing the suitable technological solutions for each project delivering a competitive LCoE.

Our team is passionate about what we do, and we are committed to delivering those products and services that best meet our customer's project needs.

Siemens Gamesa 5.X is a generation of turbines that offers:

- Flexible power output and two rotor sizes for a competitive LCoE.
- Site adaptability to configure the suitable solution for each project.
- Versatility, a highly flexible design for logistics, construction and service.

Siemens Gamesa technology

The Siemens Gamesa 5.X onshore platform has its roots in Siemens Gamesa geared technology, in which we have extensive knowledge and expertise. This include a doubly-fed generator and partial converter combination and a compact drive train design with a three-stage gearbox. The result is a wind turbine designed to enhance performance and LCoE.

Siemens Gamesa 5.X goes one step further to become a platform that combines a flexible power rating from 5.6 MW to 7.0 MW with two rotors of 155 and 170 meters, to obtain high performance in all wind conditions.

SG 6.6-155, SG 6.6-170 and SG 7.0-170 turbines offer greater AEP per wind turbine and improved project CAPEX. This is due to the versatility created by a modular, flexible design that eases logistics, construction, and O&M. As a result, OPEX is also reduced, which results in a lower Cost of Energy for the project.

Unique, tailored solutions

Siemens Gamesa 5.X considers profitability to be a key factor in generating value for our customers.

Contributing factors to profitability include:

- Configurable, flexible, personalized power modes fully tailored to the needs of each site.
- An extensive catalog of towers with multiple available technologies and the additional capability to create specific project designs.
- Control strategies that enable intelligent load reduction and a greater applicability the Siemens Gamesa 5.X platform in different wind conditions.
- A modular, enhanced structure for local transport and construction conditions.
- A maintainability-oriented design with advanced diagnostics and remote operation solutions, as well as the possibility of replacing large turbine components without requiring a main crane.
- Optional product solutions to cover all types of market requirements.

Technical specifications

	SG 6.6-155	SG 6.6-170	SG 7.0-170
General details			
Rated power	6.6 MW		7.0 MW
IEC class	IIB (25 years lifetime) IIA (20 years lifetime) IA (25 years lifetime	S/IIIB (25 years lifetime) IIIA (20 years lifetime)	IIA (25 years lifetime)
Flexible power rating	5.6 MW-6.6 MW	6.0 MW-6.6 MW	Up to 7.0 MW
Control	Pitch and variable speed		
Rotor			
Diameter	155 m	170 m	
Swept area	18,869 m^2	22,697 m^2	
Tower			
Height	90, 102.5, 107.5, 122.5, 165 and site-specific	100, 110.5, 115, 135, 145, 150, 155, 165, 185 and site-specific	115, 135, 155, 165, 185 m and site-specific
Technology			
Type	Geared		
First prototype			
Date	2021		TBD

V172-7.2 MW™

Press Release

Discover the EnVentus™ platform

The V172-7.2 MW™ is designed for low to medium wind conditions and offers expanded site applicability through flexible ratings.

V172-7.2 MW™ at a glance

The V172-7.2 MW™ improves Annual Energy Production by 12% in low wind conditions through enhancements in powertrain and power conversion systems. Flexible ratings of 6.5 MW, 6.8 MW and 7.2 MW combined with available CoolerTop options expands the site applicability across cold and hot climates.

Designed with full value chain in mind, the V172-7.2 MW™ realises improved transportability of the nacelle unit, as well as the flexibility to service and upgrades over the turbine's operational lifetime.

EnVentus™ brochure

EnVentus™ video

Vestas Services

Options available for the V172-7.2 MW™ IEC S

- 6.5 MW Operational Mode
- 6.8 MW Operational Mode
- Oil Debris Monitoring System
- High Temperature Cooler Top
- Service Personnel Lift
- Low Temperature Operation to -30°C
- Vestas Ice Detection™
- Vestas Anti-Icing System™

Learn more about the available options and solutions

- Vestas Shadow Flicker Control System
- Aviation Lights
- Aviation Markings on the Blades
- Fire Suppression System
- Vestas Bat Protection System
- Lightning Detection System

POWER REGULATION OPERATIONAL DATA

Pitch regulated with variable speed

Standard rated power	7,200kW
Cut-in wind speed	3m/s
Cut-out wind speed	25m/s
Wind class	IEC S
Standard operating temperature range	from -20°C* to +45°C

*High wind Operation available as standard

SOUND POWER

Maximum	106.9dB(A)**

**Sound Optimised Modes available dependent on site and country

ROTOR

Rotor diameter	172m
Swept area	23,235m2
Aerodynamic brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Converter	full scale

GEARBOX

Type	two planetary stages

TOWER

Hub heights*	114 m (IEC S), 150 m (IEC S), 164 m (DIBt), 166 m (IEC S), 175 m (DIBt) and 199 m (DIBt)

*Site specific towers available on request

SUSTAINABILITY

Carbon Footprint	6.4g CO2e/kWh
Return on energy break-even	6.9 months
Lifetime return on energy	34 times
Recyclability rate	86.6%

Configuration: 166m hub height, Vavg=7.4m/s, k=2.48. Depending on site-specific conditions. Metrics are based on an internal streamlined assessment. An externally reviewed Life Cycle Assessment will be made available on vestas.com once finalised.

7.2 MW

Connecting proven system designs from the 2 MW, 4 MW, and 9 MW platforms, the V172-7.2 MW™ features three flexible ratings of 7.2 MW, 6.8 MW & 6.5 MW.

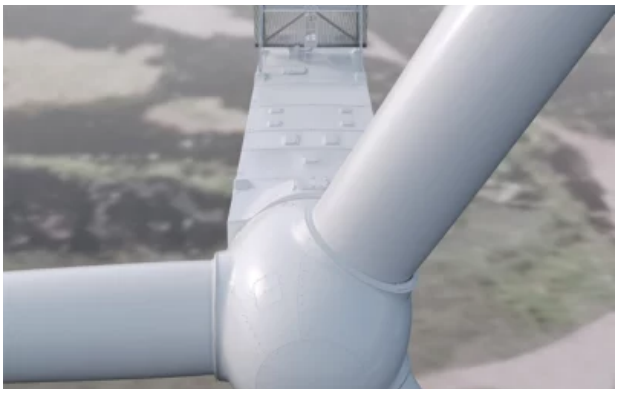
IEC S

The V172-7.2 MW™ is designed for low to medium wind sites combined with extreme wind speeds of up to 39.5m/s.

40 years

With more than 173 GW of wind turbine capacity installed and 40 years of experience in relentlessly pursuing performance improvements, EnVentus™ is Vestas' next generation in the evolution of wind turbines.

Related products



V162-7.2 MW™

The V162-7.2 MW features flexible rating, designed to deliver optimised energy production even with greater temperature and climate variations. Modularised nacelle allows for expanded applicability regardless of geographical remoteness, providing use case flexibility throughout the operational lifetime.

V162-6.2 MW™

With a swept area of over 20,000m², the V162-6.2 MW™ applies the largest rotor size in the Vestas portfolio to achieve industry-leading energy production paired with a high capacity factor.

V150-6.0 MW™

The V150-6.0 MW™ lifts the larger rotor introduced with V150-4.2 MW™ into stronger wind speeds. Combined with its higher generator rating, it increases the production potential at turbine level by more than 20 percent compared to V150-4.2 MW™ in medium wind speed conditions.

V172-7.2 MW™ IEC S

Power regulation	Pitch regulated with variable speed

Operating data

Standard rated power	7,200kW
Cut-in wind speed	3m/s
Cut-out wind speed*	25m/s
Wind class	IEC S

Standard operating temperature range from -20°C to +45°C

* High Wind Operation available as standard

Sound power

Maximum	106.9dB(A)*

* Sound Optimised Modes available dependent on site and country

Rotor

Rotor diameter	172m
Swept area	23,235m^2
Aerodynamic brake	full blade feathering with 3 pitch cylinders

Electrical

Frequency	50/60Hz
Converter	full scale

Gearbox

Type	two planetary stages

Tower

Hub heights*	114m (IEC S)**
	150m (IEC S)**
	164m (DIBt)
	166m (IEC S)
	175m (DIBt)
	199m (DIBt)

*Site specific towers available on request
**Preliminary

Turbine options

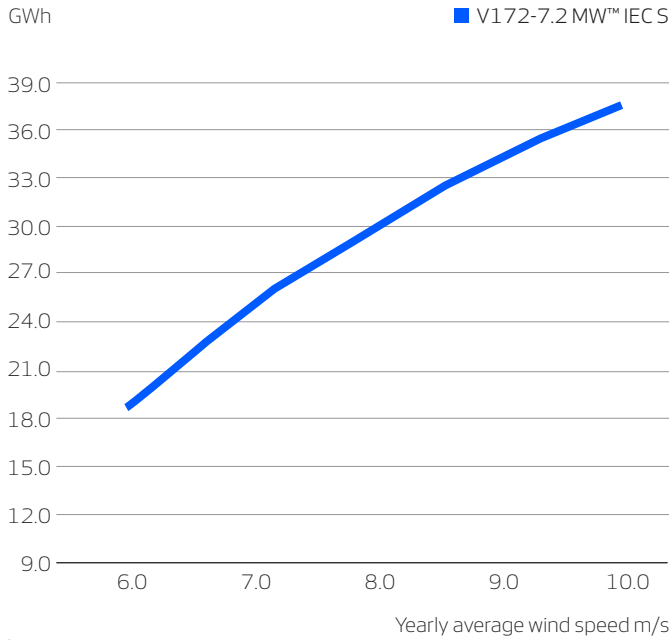
- 6.5 MW Operational Mode
- 6.8 MW Operational Mode
- Oil Debris Monitoring System
- High Temperature CoolerTop
- Service Personnel Lift
- Low Temperature Operation to -30°C
- Vestas Ice Detection™
- Vestas Anti-Icing System™
- Vestas Shadow Flicker Control System
- Aviation Lights
- Aviation Markings
- Fire Suppression System
- Vestas Bat Protection System
- Lightning Detection System

Sustainability

Carbon Footprint	6.4g CO_2e/kWh
Return on energy break-even	6.9 months
Lifetime return on energy	34 times
Recyclability rate	86.6%

Configuration: 166m hub height, Vavg=7.4m/s, k=2.48. Depending on site-specific conditions. Metrics are based on an internal streamlined assessment. An externally reviewed Life Cycle Assessment will be made available on vestas.com once finalised.

Annual energy production



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2
Standard air density = 1.225, wind speed at hub height