



## 01<sup>07</sup> AT A GLANCE

4 MW+

### PERFORMANCE OUTPUT

SOUND-, POWER- AND LOAD-  
MODES

+28%

### HIGHER AEP

HIGHER AEP, HIGHER EFFICIENCY

106.1  
dB(A)

### LESS SOUND, MORE POWER

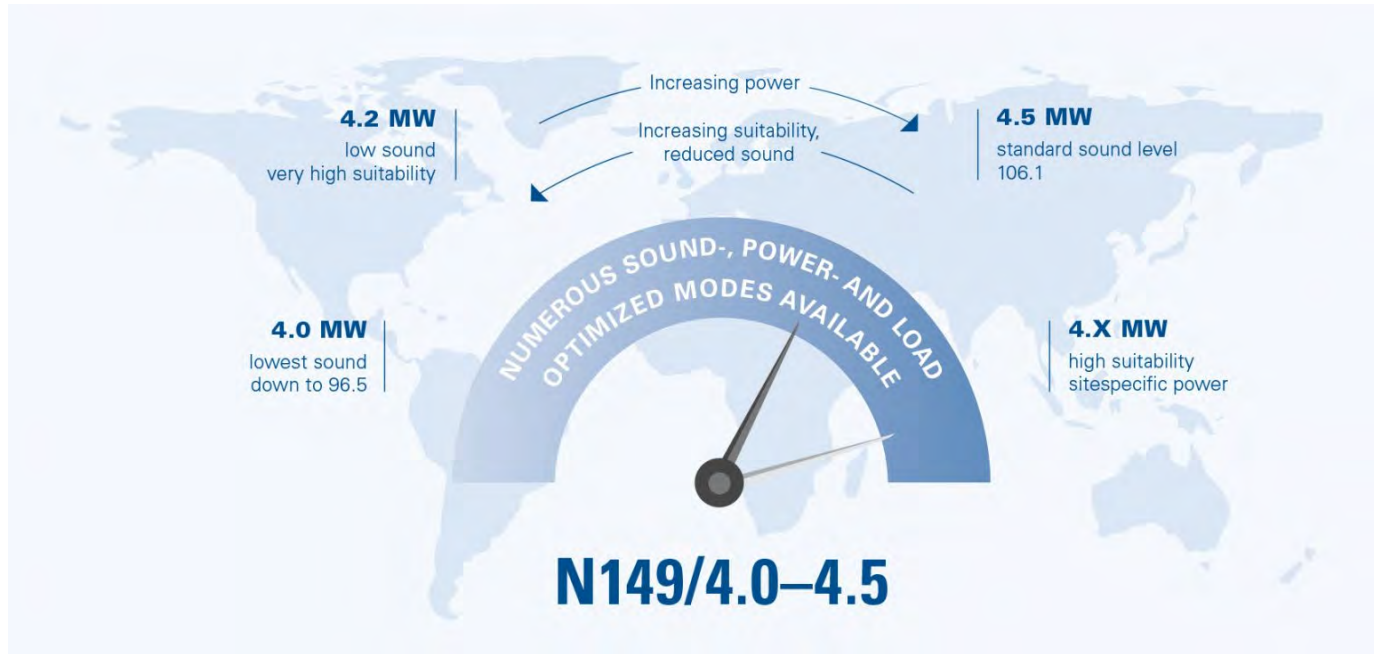
106.1 dB(A) AT 4.5 MW

## 02<sup>07</sup> HIGHLY FLEXIBLE SITEABILITY

### ADAPTABLE TO VARIOUS SITE CONDITIONS

With the N149/4.0–4.5, the Nordex Group was the first company to launch a turbine with a flexible rating as part of its core design philosophy and operation strategy. This design approach, combined with a variety of operating modes, enables the utilization of the N149/4.X across a large range of

projects – from medium wind projects in Australia to highly complex sites in Germany or Scandinavia.



**03**<sup>07</sup>

## DELTA4000 ARCHITECTURE CERTIFIED ON SITE



### PROVEN TECHNOLOGY

As of October 2022

The N149/4.0-4.5 prototypes were installed in the summer of 2018, meaning the main warranted performance figures, such as the power curve and most relevant sound power modes, have already been confirmed by measurements from certified third parties.

**04**<sup>07</sup>

## TECHNICAL DATA

### Operating data

**Rated power**

4.0–4.5 MW (project specific up to 4.8 MW)

**Cut-in wind speed**

3 m/s

**Cut-out wind speed**

20 m/s (project specific up to 26 m/s)

### Rotor

**Diameter**

149.1 m

**Swept area**

17,460 m<sup>2</sup>

### Gearbox

**Type**

Type 3-stage (planetary-planetary-spur gear)

### 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**

Holding Brake Disc brake

## Hub height

**Hub height**

up to 164 m, project – and sitespecific

## 05<sup>07</sup> THE STRATEGY- EVOLUTIONARY

### CONNECTING PROVEN TECHNOLOGY WITH INNOVATIVE ENGINEERING

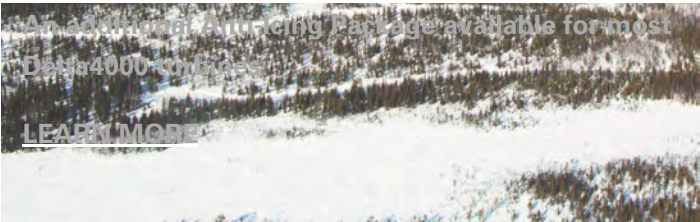
For the Delta4000 product series, we took over the Delta Generation's fundamental design and transferred it to the 4 MW, 5 MW and 6MW+ classes.

Depending on investment criteria of the customer's business case, the wind farm can be optimized with in terms of AEP, rating, lifetime and sound requirements. In addition, this flexibility offers opportunities to optimize the revenues in line with PPA structures and merchant price profiles.

1. OPTIMIZED POWER TRANSFER
2. LARGER ROTOR DIMENSIONS
3. REDUCED SERVICE EFFORTS
4. MAINTAINED ELECTRICAL SYSTEM
5. RELIABLE DRIVETRAIN CONCEPT
6. GRID COMPATIBILITY GUARANTEED

## 06<sup>07</sup> MORE ABOUT THE DELTA4000 SERIES





[LEARN MORE](#)



**07**<sub>07</sub>  
**EXPLORE THE DELTA4000 PORTFOLIO**



**N175/6.X**

[LEARN MORE](#)



**N163/5.X**

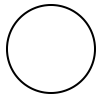
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**N163/6.X**

[LEARN MORE](#)





# V150-4.5 MW™



4 MW brochure

The V150-4.5 MW™ is designed for low wind sites, and is one of the industry's highest producing onshore low wind turbines.





## V172-7.2 MW™

The V172-7.2 MW™, featuring three flexible ratings of 7.2 MW, 6.8 MW and 6.5 MW, strengthens performance in low to medium wind conditions with expanded site applicability. Sharing the same modularised nacelle architecture with the V162-7.2 MW™, the V172-7.2 MW™ offers flexibility in service and upgrades over the turbine's operational lifetime.



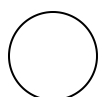
## V162-6.2 MW™

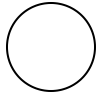
With a swept area of over 20,000m<sup>2</sup>, the V162-6.2 MW™ applies the largest rotor size in the Vestas portfolio to achieve industry-leading energy production paired with a high capacity factor.



## 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.





Building on the commercial success of the V150-4.2 MW™ for low wind conditions, the V150-4.5 MW™ captures higher park Annual Energy Production with an expanded global applicability.

Where permits allow, the higher rating variant delivers an over 3 percent increase in annual energy production compared to the V150-4.2 MW™, while maintaining the same application space and noise level.



**Track Record**



**Vestas Service**



**4 MW platform**

## Options available for the V150-4.5 MW™

- 4.5 MW Power Mode
  - Condition Monitoring System
  - Service Personnel Lift
  - Vestas Anti-Icing System™
  - Vestas Ice Detection
- 
- Fire Suppression
  - Vestas Shadow Flicker Control System
  - Vestas Bat Protection System
  - Aviation Lights
  - Aviation Markings on the Blades
  - Vestas IntelliLight®







POWER REGULATION  
OPERATIONAL DATA

Pitch regulated with variable speed

|                                      |                                                   |
|--------------------------------------|---------------------------------------------------|
| Rated power                          | 4,500kW                                           |
| Cut-in wind speed                    | 3m/s                                              |
| Cut-out wind speed                   | 24,5m/s                                           |
| Re cut-in wind speed                 | 22,5m/s                                           |
| Wind class                           | IEC S                                             |
| Standard operating temperature range | from -30°C* to +45°C with de-rating<br>above 23°C |

SOUND POWER

|         |                                                                    |
|---------|--------------------------------------------------------------------|
| Maximum | 105.0 dB(A) Sound Optimised modes<br>dependent on site and country |
|---------|--------------------------------------------------------------------|

ROTOR

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Rotor diameter    | 150m                                            |
| Swept area        | 17,671m2                                        |
| Aerodynamic brake | full blade feathering with 3 pitch<br>cylinders |



|                                     |         |
|-------------------------------------|---------|
| Height installed (incl. CoolerTop®) | 8.4 m   |
| Length                              | 12.96 m |
| Width                               | 3.98 m  |

ELECTRICAL

|           |            |
|-----------|------------|
| Frequency | 50/60 Hz   |
| Converter | full scale |

GEARBOX

|      |                                            |
|------|--------------------------------------------|
| Type | two planetary stages and one helical stage |
|------|--------------------------------------------|

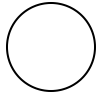
TOWER

|             |                           |
|-------------|---------------------------|
| Hub heights | Site and country specific |
|-------------|---------------------------|

HUB DIMENSIONS

|                       |      |
|-----------------------|------|
| Max. transport height | 3.5m |
| Max. transport width  | 3.7m |
| Max. transport length | 5.5m |

BLADE DIMENSIONS



Max. chord

7.2 m

Max. weight per unit for transportation

70 metric tonnes

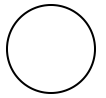
## SUSTAINABILITY METRICS PENDING

## 4 MW

The Vestas 4 MW platform sets new standards for onshore wind performance within regimes ranging from very strong wind and typhoon conditions to ultra low wind.

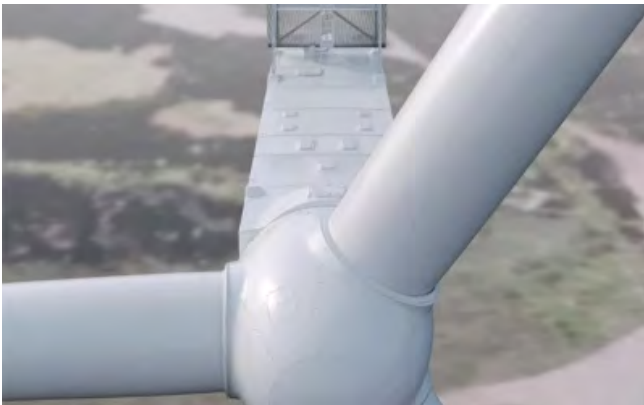
## IEC S

The V150-4.5 MW™ IEC S is designed for low-wind sites.



The performance and versatility of the 4 MW platform has been proven with more than 61 GW installed in 57 countries since 2010.

## Related wind turbines



### V162-6.2 MW™

With a swept area of over 20,000m<sup>2</sup>, 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.



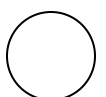
# V162-7.2 MW™



Discover the EnVentus™ platform

The V162-7.2 MW™ features flexible rating, designed to deliver optimised energy production even with greater temperature and climate variations.

Designed with full value chain in mind, the V162-7.2 MW™ realises improved transportability of the nacelle unit, as well as the flexibility to service and upgrades over the turbine's operational lifetime.



# V162-7.2 MW™ at a glance

The V162-7.2 MW™ improves Annual Energy Production by up to 7% through enhancements in powertrain and power conversion systems combined with flexible ratings of 6.5 MW, 6.8 MW and 7.2 MW, while maintaining the maximum Sound Power Level at 104.6dB(A) operating at 6.8 MW.

Improved siteability in warm climates is enabled through the optional larger CoolerTop. Designed with full value chain in mind, the V162-7.2 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**



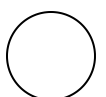
**EnVentus™ video**



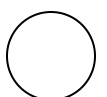
**Vestas Services**

## Options available for the V162-7.2 MW™

- 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™



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



# 7.2 MW

Connecting proven system designs from the 2 MW, 4 MW, and 9 MW platforms, the V162-7.2 MW™ features 6.5 MW, 6.8 MW and 7.2 MW three flexible ratings.

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# IEC S

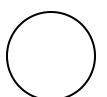
The V162-7.2 MW™ is designed for medium to high wind sites combined with extreme wind speeds of up to 41.5m/s.

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# 40 years

With more than 177 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.

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Power regulation operational data

Pitch regulated with variable speed

|                                      |                       |
|--------------------------------------|-----------------------|
| Standard rated power                 | 6,800kW               |
| 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 |

SOUND POWER

|         |              |
|---------|--------------|
| Maximum | 105.5dB(A)** |
|---------|--------------|

\*\*Sound Optimised Modes available dependent on site and country

ROTOR

|                   |                                              |
|-------------------|----------------------------------------------|
| Rotor diameter    | 162m                                         |
| Swept area        | 20,612m2                                     |
| Aerodynamic brake | full blade feathering with 3 pitch cylinders |

ELECTRICAL

|           |          |
|-----------|----------|
| Frequency | 50/60 Hz |
|-----------|----------|





## GEARBOX

Type two planetary stages

## TOWER

Hub heights 119 m (IEC S/DIBt S), 138 m (IEC S) and 169 m (IEC S/DIBt S)

Configuration 166m hub height and wind class IECS. Depending on site-specific conditions

## SUSTAINABILITY

Carbon Footprint 7.1g CO2e/kWh

Return on energy break-even 7.4 months

Lifetime return on energy 32 times

Recyclability rate 87%

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](https://vestas.com) once finalised.

## Related wind turbines



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