V52-850 kW
The turbine that goes anywhere
Versatile, efficient, dependable and popular

The highly efficient operation and flexible configuration of the V32 make this turbine an excellent choice for all kinds of wind conditions. In addition, thanks to its modest dimensions, the V32 is simple and cost-effective to transport and install. If you add to robust construction, thoroughly tested components and an enviable track record, it is easy to see why Vestas has erected more V32s than any other turbine in its portfolio—approximately 1500 turbines, all over the world.

One of the factors that contribute to the success of the V32 is OptiTip, its pitch regulation system. This system features microprocessors that control the pitching of the blades, thus ensuring continuous adjustment to maintain optimal blade angles in relation to the prevailing wind. At the same time, OptiTip makes it possible to keep sound levels within the limits stipulated by local regulations.

The optimal solution

Another innovative feature of the V32 is the OptiSpeed* generator. This is a significant advance in wind turbine technology and makes a major contribution to the efficiency of the V32. In practice, it allows the turbine rotor speed to vary between 14 and 31 rpm depending on the conditions at any given time.

While the technology involved may be advanced, its purpose is simple: to maximize output. It does this by tapping the higher efficiency of slow and variable rotation, storing excess energy in rotational form and exploiting the full force of transient gusts. All told, OptiSpeed boosts annual energy production.

As an added benefit, OptiSpeed also reduces wear and tear on the gearbox, blades and tower on account of lower peak loads. Moreover, in turbine sound, it is a function of wind speed, the lower rotation speeds made possible by OptiSpeed naturally reduce sound levels.

Finally, OptiSpeed helps the V32 deliver better quality power to the grid, with rapid synchronization, reduced harmonic distortion and less flicker.

Quite simply, OptiSpeed means more output, better quality power and less mechanical stress and sound.

Proven Performance

Wind power plants require substantial investments, and the process can be very complex. To assist in the evaluation and purchasing process, Vestas has identified four factors that are critical for wind turbine quality: energy production, operational availability, power quality and sound level.

We spend months testing and documenting these performance areas for all Vestas turbines. When we are finally satisfied, we ask an independent testing organization to verify the results—a practice we call Proven Performance. At Vestas we do not just talk about quality; we prove it.

*Vestas OptiSpeed is not available in the USA and Canada.
Technical specifications

1. Ultrasonic wind sensor
2. Service crane
3. VMP-Top controller with converter
4. OptiSpeed generator
5. Pitch cylinder
6. Oil and water coolers
7. Gearbox
8. Main shaft
9. Pitch system
10. Blade hub
11. Blade bearing
12. Blade
13. Rotor lock system
14. Hydraulic unit
15. Torque arm
16. Machine foundation
17. Mechanical disc brake
18.Yaw gear
19. Composite disc coupling

The figure above illustrates the power curves at different sound levels for the V52-850 kW turbine, which is equipped with OptiSpeed.

The sound output level can be adjusted by varying the rotation speed of the turbine as illustrated in the figure above. It clearly shows the sound level advantages of lower speeds of revolution because the sound level is approximately 7 dB(A) lower at 8 m/s than at 10 m/s. For other sound levels, the benefit can be as much as 10 dB(A). Please note that a decrease of 3 dB(A) represents a halving of the sound level.
Rotor

- Diameter: 52 m
- Area swept: 2,412 m²
- Nominal rotation: 20 rpm
- Operational interval: 14:51–4 rpm
- Number of blades: 5
- Power regulation: Pitch/OptiSpeed
- Air brake: Full blade pitch

Tower

- Hub height: 40 m, 44 m, 48 m, 46 m, 55 m
- 60 m, 65 m, 74 m, 86 m

Operational data

- Cut-in wind speed: 4 m/s
- Nominal wind speed: 16 m/s
- Cut-out wind speed: 25 m/s

Generator

- Type: Aerogenerator with OptiSpeed
- Nominal output: 850 kW
- Operational data: 50 Hz/60 Hz
- 608 V

Gearbox

- Type: 1 planet step/2 step parallel axle gears

Control

- Type: Microprocessor-based monitoring of all turbine functions as well as OptiTip, output regulation and OptiTip pitch regulation of the blades.

Weight

- Nacelle: 22 t
- Rotor: 10 t
- Tower:
  - 40 m: 43 t
  - 44 m: 43 t
  - 48 m: 43 t
  - 50 m: 55 t
  - 60 m: 70 t
  - 67 m: 75 t
  - 75 m: 95 t
  - 80 m: 110 t

(“t” metric tonnes)

OptiSpeed allows the wind speed to vary within a range of approximately 60 per cent in relation to maximum rpm. Thus with OptiSpeed, the wind speed can vary by as much as 30 per cent above and below maximum rpm. This minimizes both unscheduled fluctuations in the output to the grid supply and the loads on the wind parts of the construction.

All specifications subject to change without notice.
The turbine that goes anywhere

If you have a viable wind power site, chances are that the V90 will do well there. That is because of Vestas, we have devoted the last 23 years to expanding the range of conditions under which wind can be profitably harnessed — and because the V90 represents Vestas at its most versatile.

An all-round performer this 3 MW wind turbine is our most adaptable turbine, well suited for a broad spectrum of medium and high-winds. This turbine we have installed approximately 1000 V90s all over the world.

Several factors contribute to the flexibility of this wind turbine. Not only is the V90 available with eight different tower heights, but its modest size and remarkable sound profile also make it the perfect choice for both populated and remote locations. As a finishing touch, its compact dimensions make overland transport simple.

The V90 is also the only kW-class turbine to be fitted with OptiSpeed, a technology that allows the rotor speed to vary within a range of approximately 90 per cent in relation to nominal rpm. This means that with OptiSpeed, the rotor speed can vary by as much as 30 per cent above and below synchronous speed. OptiSpeed thereby maximises the aerodynamic efficiency of the rotor in response to changing wind conditions — and provides yet another instance of how Vestas versatility enhances the delivery of dependable power.