

[RE]built

TECHNICAL
DESCRIPTION

[RE]built wind turbine

VESTAS

V39 500kW, V42/V44-600kW, V47-660kW



[RE]built

on experience

[RE]built PROCESS

- All components are removed for cleaning and inspection.
- Any component not meeting OEM manufacturer specifications is repaired or replaced.
- The nacelle frame is inspected for cracks and overall structural integrity. Any deficiencies are repaired and tested.
- The machine base and frame are stripped of all paint, cleaned of dirt and lubricant, and repainted.
- All critical rotating components (cylinders, rollers, etc.) are inspected for run-out. Any component not meeting OEM manufacturer specifications are repaired or replaced.
- All bearings (roller or plain) are repaired or replaced with new.
- All belting is repaired or replaced with new.
- All rubber hydraulic lines are repaired or replaced with new.
- All polymer couplings are repaired or replaced with new.
- All hardware is repaired or replaced with new.
- All gear boxes are cleaned, inspected, and new seals installed. Gears are inspected and repaired or replaced if needed.
- All generators are cleaned, inspected, and 100% rewound.
- Brake calipers are rebuilt, including new brake rotor and brake pads.
- Bull (Yaw) gear is repaired or replaced with new having a wider face than the OEM gearing.
- Pinion gear is repaired or replaced with new having a wider face than the OEM gearing.
- All Oil on wear blocks are replaced with new.
- All blades are inspected for defects, including wear, cracks, and blemishes. Deficiencies are repaired and the surface profiles returned to OEM manufacturer specifications.
- All blades are protected with a new covering of gel coat.
- All blades are weighed, balanced, and matched.
- Blade over-speed mechanisms are inspected. Any component not meeting OEM manufacturer specifications are repaired or replaced.
- All electrical wiring and components are new and upgraded above and beyond original manufacturer specifications.
- The main control system is repaired or replaced for new.
- Wind vane and anemometer are repaired or replaced with new.
- ABB full power converter

Design

wind turbine



The Vestas V39 500kW, V42/V44-600kW, V47-660kW wind turbine is a pitch controlled upwind turbine with active yaw and a rotor with three blades.

The pitch control means that the blades can pivot upon their own longitudinal axis. The pitch control is used for speed control, optimization of power production and to start and stop the turbine.

The blades are made from glass fibre. The shells are made in a light sandwich construction and mounted on a supporting closed beam of prepreg. Through a bonded aluminum root-insert the blades are bolted to the blade bearing. The blade bearing is bolted to the blade hub.

The mechanical power from the rotor is transmitted through the main shaft to the gearbox. The gearbox is a combined planet and helical gearbox. From the gearbox the power is transmitted through a cardan shaft to the generator.

For 500kW the generator is designed with constant slip of 2-3% (depending of type of generator).

The 500 and 660kW generator is designed with integrated electronics. Then it is able to operate with a variable slip between 1% and 10%. V47-660kW/200kW is equipped with two generators with nominal effect at 660kW and 200kW. Each generator has individual gearing and outlet at the gearbox.

All functions of the turbine are monitored and controlled by a microprocessor based control unit, VMP-controller (Vestas Multi Processor controller)

In the operating state EMERGENCY STOP the turbine is by full-feathering of the blades (aerodynamic brake).

The EMERGENCY STOP BUTTON (manual emergency) activates both the aerodynamics brake and the hydraulic disc brake, which is placed at the high speed shaft of the gearbox.

The pitch control is performed by activating a hydraulic/mechanical system. The hydraulic system is also used for disc brake system.

Yawing is done by two electrical yaw gear motors, which mesh with a toothed wheel mounted on top of the tower. The bearing system is a slide system with built-in friction.

The nacelle is fully enclosed in a glass fibre reinforced polyester cover. Access to the nacelle is inside the tower.

The nacelle can be opened to the back and with the crane it is possible to bring up and down tools, spareparts, etc.

Reliable, competitive and compliant

Re-built the future of wind

Cheaper to transport, quicker to install

The light weight of the Vestas V39 500kW, V42/V44-600kW, V47-660kW minimises construction and transportation costs.

The Vestas features a compact style of blade transportation which allows the safe transportation of three blades at one time using existing trucks and cranes. This makes installation quicker and minimises transportation costs.

Lowering maintenance costs for greater profitability

Maintenance and repairs can now be performed faster and cheaper up-tower, and with greater technical ease, thanks to our updated ergonomic nacelle design with increased access and working environment.

With a ABB full scale converter, the [Re]built Vestas complies with even the most challenging grid requirements of the modern energy market.

Low Balance of Plant (BOP)

Installation and transportation costs Just like [RE]built Vestas is designed to be transported easily (by rail, truck or barge) to virtually any site around the world.

Specifically, not one of its components weighs more than 40 tonnes. Your foundation costs are also lowered with the [RE]built Vestas due to its improved load control. The innovative power system provides excellent grid support and is highly adaptable for future technical requirements. It also enables substations to be simpler and therefore more cost-effective.

Easy-access serviceability

The [RE]built Vestas nacelle is ergonomically. This extra space also makes it easier for maintenance crews to gain access – reducing the time and cost spent on servicing and therefore maximising uptime. The automatic lubrication of the yaw system, main bearing and generator delivers the triple benefit of increased reliability, reduced maintenance time and less frequent servicing. Combined, these factors save you money and maximise your returns on the wind energy produced on low- and medium-wind onshore sites.

The [RE]built Vestas can be put into place and maintained using tools and equipment that are standard within the installation and servicing industries – minimising ongoing maintenance costs.

The technology you need

– wherever you need it

Grid requirements

The [Re]built BONUS-600 kW turbines are designed for optimum compliance with grid standards worldwide. The Full Power Converter of ABB advanced grid compliance system provides active and reactive power regulation, fast response to changes in frequency, and fault ride-through capabilities to support grid levels and stability in the event of grid fluctuations.

Investing in a [Re]built BONUS-600 kW means investing in turbines that can adapt to even the most challenging grid codes.



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Full Converter

A brand new ABB full converter transforms the energy output to DC and inverts again to AC allowing the generator to produce electricity at all the range of Capacitors and reactors provide reactive energy transferring all active power to the grid.

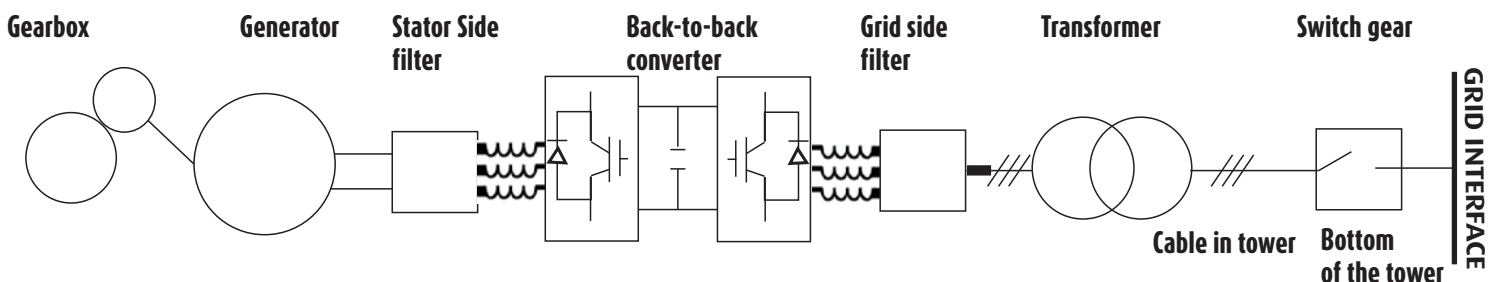
LCL filters control the THD injection in the grid keeping low additions and being compliant in all grid codes.

Robust control can keep the turbine connected during a low voltage helping the grid stability.

Advantages of Full Converter

1. Reactive compensation from 0.8Cap to 0.8ind
2. LCL filter for Harmonics limiting THD emissions into the grid
3. Low Voltage Ride Through capabilities.
4. Dynamic power factor control and voltage control
5. Primary response in frequency control
6. Crow bar optional for safety breaking

Excellent grid support



The experience to secure

your wind energy investment

Vestas V39 295.000 €

Vestas V42 315.000 €

Vestas V47 365.000 €

**2 year guarantee
EXWORK terms of sale**

Optimise energy production

- Designed for high productivity
- Excellent grid support
- Pitch control

Reduce energy costs

- Low Balance of Plant (BOP), installation and transportation costs
- Designed for serviceability
- Innovative ABB full Power Converter uses the wind's own energy

Secure your investment

- Proven technology
- Reliable and robust product



**Sageguarding
your
investment,**
powering your profits

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available, which may not apply in all cases.
The required technical options should therefore
be specified in the contract.