

750i kW
Series



A New Generation of Power.

Enron Wind 750i kW Series

Enron Wind

Enron Wind Technology.

Superior power quality. Maximum energy capture.

Reactive power control and voltage support. Reduced loads.

With advanced wind turbines ranging from 750 kW to 2.0 MW, Enron Wind provides customized solutions for today's challenging on and offshore requirements. Enron Wind technology features PowerMax™ variable speed control for reliable, cost-effective operation and offers its patented Dynamic VAR Control for local grid support and improved transmission efficiencies. Enron Wind's ISO Quality Systems Certified manufacturing facilities are located in California, Germany and Spain.

The Enron Wind 750i kW Series Wind Turbine.

For applications requiring sub-megawatt wind turbines, our customers find that the Enron Wind 750i kW Series combines proven technology with every advantage available to compete and excel in today's competitive wind power market. Enron Wind's 750i kW Series design is based on our successful and proven Z 750 kW Series wind turbines, utilized in the world's largest and most cost-competitive wind power projects. With more than 650 Z 750s in operation today and another 130

Enron Wind 750i kW Series wind turbines soon to be supplied in Spain, our 750 kW Series continues to raise the bar when it comes to high-performance and cost-effective, reliable operation.

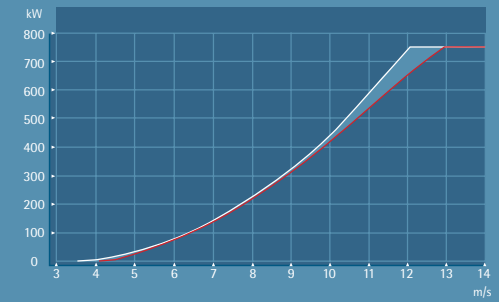


The Enron Wind 750i kW Series wind turbines are active yaw and pitch regulated with power/torque control capability. The rotor utilizes blade pitch regulation and variable speed operation to achieve optimum power output. An integrated drivetrain combines the main shaft and gearbox into one unit, minimizing turbine parts and increasing strength. The Enron Wind 750i kW Series technology is designed in accordance with the International Electrotechnical Committee 1400-1 Standard and Germanischer Lloyd's Rules and Regulations for wind turbine design. The design has been life-cycle tested to 30 years.

Superior Technology for Maximum Energy Capture.

At the heart of the Enron Wind technology is a patented power electronic converter which converts the wind turbine's variable speed operation into constant frequency power required by the utility. The results are remarkable – higher energy yield and high quality power that is fully compliant with IEEE-519 power quality requirements.

VARIABLE VS. CONSTANT SPEED POWER



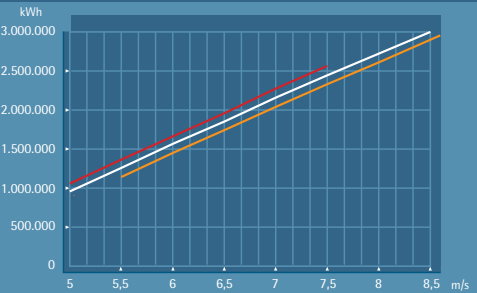
Variable Speed

Constant Speed

Wind speed at hub height • Standard atmosphere according to DIN ISO 2533, M.S.L. Standard Rayleigh distribution and unobstructed air flow

The Enron Wind variable speed wind turbines yield more energy capture than constant speed wind turbines, providing increased power generation at lower cost.

ENRON WIND 750i kW ANNUAL YIELD



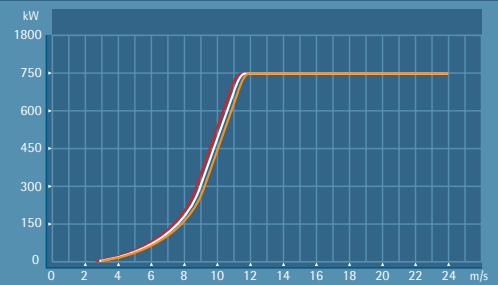
750i kW/46

750i kW/48

750i kW/50

Wind speed at hub height • Standard atmosphere according to DIN ISO 2533, M.S.L. Standard Rayleigh distribution and unobstructed air flow

ENRON WIND 750i kW POWER CURVE *



750i kW/46

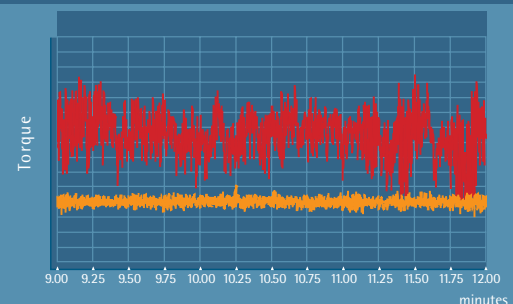
750i kW/48

750i kW/50

Wind speed at hub height • Standard atmosphere according to DIN ISO 2533, M.S.L. Standard Rayleigh distribution and unobstructed air flow

* Warranted power curve may vary depending on blade selection.

VARIABLE VS. CONSTANT SPEED TORQUE

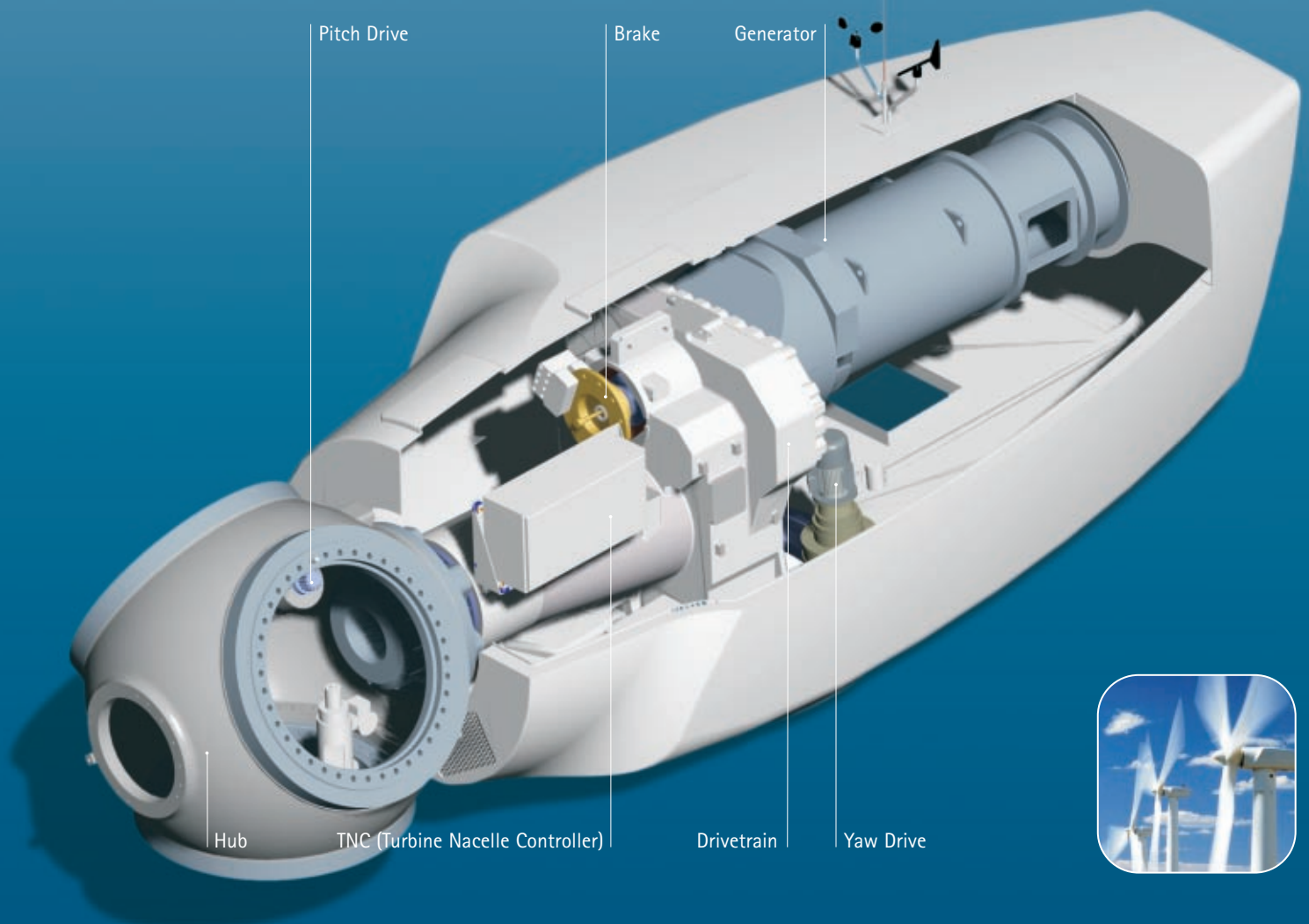


Variable Speed

Constant Speed

Wind speed at hub height • Standard atmosphere according to DIN ISO 2533, M.S.L. Standard Rayleigh distribution and unobstructed air flow

Enron Wind's variable speed operation provides reduced mean torque loads and smaller torque excursions for a given power output compared to constant speed wind turbines.



Higher Energy Capture and Reduced Loads.

By design, through its advanced electronics and aerodynamics, the Enron Wind technology captures significantly more energy than constant speed wind turbines at lower cost. While constant speed rotors must be designed to resist high loads when subjected to wind gusts, Enron Wind's variable speed PowerMax system enables the loads from the gust to be absorbed and converted to electric power output. By adjusting blade pitch through the turbines' variable pitch

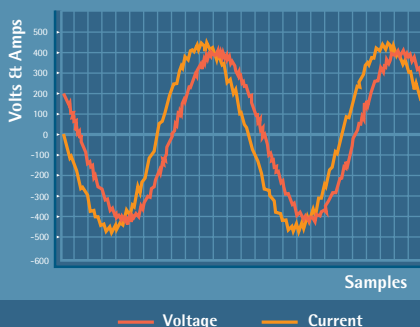
operation, rotor speed is controlled. Generator torque is controlled through the frequency converter. This combined control strategy allows higher rotor rpm in strong, gusty winds, thereby reducing torque loads in the drivetrain. PowerMax also provides active damping of the entire wind turbine system, resulting in considerably less tower oscillation as compared to constant speed wind turbines. Active damping of the machine also limits peak torque, providing greater drivetrain reliability, reduced maintenance cost and longer turbine life.



Dynamic Reactive Power (VAR) and Voltage Support.

Enron Wind's Dynamic VAR Control option provides support to local grid voltage, improving transmission efficiencies and providing the utility grid with reactive power (VARs) to further strengthen the grid. The Enron Wind technology, outfitted with its patented Dynamic VAR Control option, can automatically maintain defined grid voltage levels and/or deliver reactive power (VARs) to the utility. This feature is particularly beneficial to weaker grids.

DYNAMIC REACTIVE POWER (VAR): LEADING POWER FACTOR



Enron Wind's Dynamic Reactive VAR Control enables the wind turbine to generate reactive power (current leading voltage), providing transmission efficiencies and enhanced voltage stability, which is particularly beneficial in weak grid applications.

Specifications – Enron Wind 750i kW Series

Performance

Cut-in wind speed
Cut-out wind speed (5 sec. gust)
Rated wind speed

46m

4.5 m/s
29 m/s
12.1 m/s

48m

3.5 m/s
29 m/s
11.6 m/s

50m

3.0 m/s
29 m/s
11.2 m/s

Rotor

Number of blades
Diameter
Swept area
Rotor speed (variable)
Maximum tip speed
Blade length

3
46 m
1662 m²
20-34.1 rpm
82.1 m/s
22.2 m

3
48 m
1810 m²
20-34.1 rpm
85.7 m/s
23.2 m

3
50 m
1963 m²
20-32.3 rpm
84.6 m/s
24.2 m

Gearbox

Type: integrated 2 stage with parallel shafts: $i = 40.65$

Generator

Type: doubly fed wound rotor induction generator
Rated power: 750 kW

Inverter

Type: IGBT-frequency inverter

Braking Systems

Individual pitch regulation for each blade
Brake control system: fail-safe
3 individual aerodynamic brake systems
Mechanical parking brake

Yaw System

Four-point, contact ball bearing
Motor driven with wind direction sensor and automatic cable unwind

Control System

32 bit microprocessor-based, embedded microcontroller
Remote control operating system

Tower

Multi layer coated, tapered tubular steel tower with interior safety ladder to the nacelle
Hub height: 55 or 65 m

Lightning Protection System

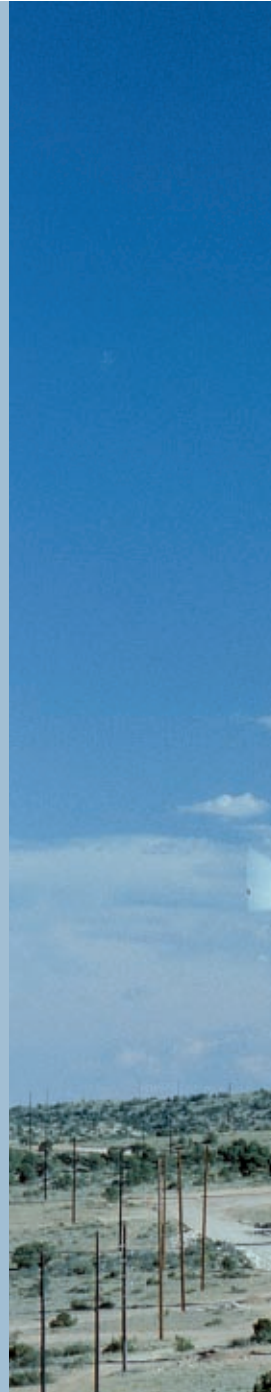
Lightning protection installed on blade tips
Discharge inside the rotor blades along nacelle and tower

Sound Proofing

Structure borne noise insulation of the tower
Noise reduced nacelle



Specifications subject to possible modification.



Global Manufacturing Capabilities

Americas

13681 Chantico Road
Tehachapi, CA 93561, USA
T. +1 661 823 6423
F. +1 661 823 1829
e-mail: wind@enron.com
www.wind.enron.com

Europe

Germany

Holsterfeld 5a
48499 Salzbergen, Germany
T. +49 (0)5971 980 0
F. +49 (0)5971 980 1090

Spain

Carretera N-400, Km. 57
45350 Noblejas (Toledo), España
T. +34 (0)91 724 3200
F. +34 (0)91 724 3299

Enron Wind offers ISO 9001 Quality Systems Certified manufacturing, experienced power plant design and engineering, development expertise, creative financing options, experienced operations and maintenance, and responsive and reliable customer service. Its wind technology has been utilized in world-class projects around the globe, including the world's three largest wind power projects. As a part of Enron Corp., with \$46 billion in assets, Enron Wind shares the diverse resources of the world's leading energy and communications company.

Enron is a leader in providing cleaner energy sources worldwide. We know that renewable energy will be an integral part of the world energy mix in the next century, and we are committed to helping our partners and customers design and implement energy solutions for their unique energy needs. Every relationship we pursue bears our uncompromising commitment to quality and innovation.



Endless possibilities.™