

## Efficient technology for reliable wind power generation

### Rotor

Type	3 blades, horizontal axis
Rotor diameter	116m
Swept area	10568 m <sup>2</sup>
Wind category	IEC III, DIBt 2
Power regulation	Pitch control
Tilt angle	4 °
Pitch system	Individual electrical drive

### Operating data

Rated power	3000 kW
Cut-in wind speed	3 m/s
Rated wind speed	11.3 m/s
Cut-out wind speed	23 m/s
Short time cut-out wind speed	30 m/s

### Generator

Type	Direct driven permanent-magnet generator
Rated speed	12 rpm
Rated voltage	690 V
Cooling	Air-cooled

### Supporting structure

Hub	Nodular cast iron
Main bearing	Adjusted bearing unit
Main frame	Nodular cast iron

### Yawing

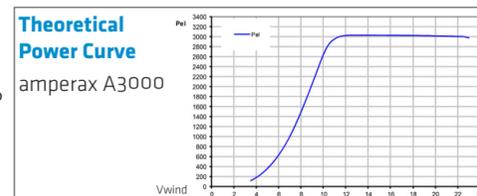
Type	Aktive
Yaw bearing	Friction bearing elements
Yaw drive	8 electric drives
Yaw brake	Friction of the bearing elements

### Converter

Type	Full power converter
Grid frequency	50 Hz
Control	Modular PLC
Cooling	Water cooled

### Control system

Type	Modular PLC
Internal communication	PROFINET, CAN Bus, TCP/IP
HMI	Touch panel
Park communication	Industrial Ethernet



## A3000: Innovative, efficient and reliable

The experience gained after many years of turbine operation and maintenance with different kind of turbine types has crucially influenced the development of the A3000. Thus a remarkably efficient and reliable machine with minimal maintenance requirements has been designed. The A3000 can

be delivered with different hub heights and for different climate conditions; on steel towers or on higher hybrid towers with a concrete base, either for standard temperature environments or for cold climates, certified according to the latest wind turbine guidelines of Germanischer Lloyd.



Hub height 92m

Wind class IECIII/DIBt2  
Steel tower consisting of four tubular segments  
Standard temperature conditions



Hub height 122m

Wind class IECIII/DIBt2  
Hybrid tower consisting of a concrete base and two tubular segments  
Low temperature conditions



Hub height 142m

Wind class IECIII/DIBt2  
Hybrid tower consisting of a concrete base and two tubular segments  
Standard temperature conditions



amperax A 3000

# Power to do more

Direct-Drive Technology

Rated power 3.0 MW / Rotor ø 116 m

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# High-Tech Direct-Drive for low-wind conditions

## Full power converter technology

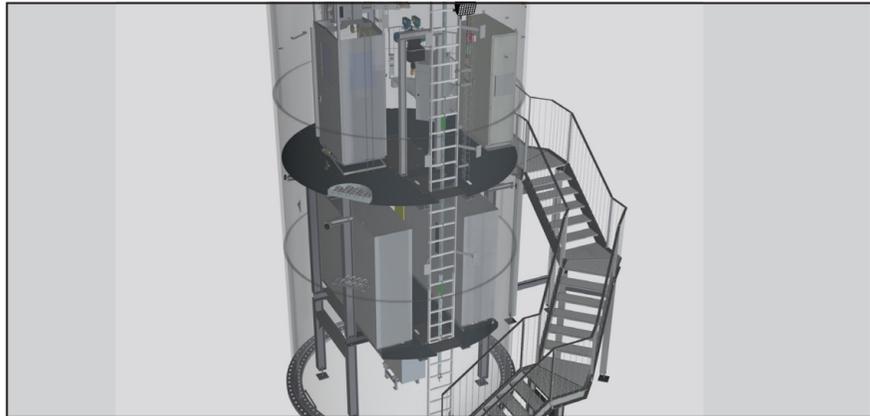


The continuous improvement in the design of electro-technical components offers the possibility to use a new generation of generators and converters for this new wind turbine. The power electronics are now all located in the bottom of the tower. By means of full power conversion technology the wind turbine can meet the requirements of all the relevant grid codes (including but not limited to BDEW Medium-Voltage Technical Guideline 2008, SDL-WindV).

## Control Unit



The wind turbine is controlled by a microprocessor-based industrial computer. This control unit comprises all safety devices. The unit can be adapted and configured according to the specific requirements of each wind farm. For monitoring, error analysis and remote control purposes, the wind turbine is equipped with a SCADA (Supervisory Control and Data Acquisition)-system.



## Rotor

The A3000 has rotor blades made of fibre glass-reinforced epoxy resin with integrated lightning protection. Each rotor blade is connected to the hub by a double-row ball bearing and has individual electrical activation. The special emergency stop system is equipped with a separate pitch control mechanism, which enables the blades to rotate up to a predefined park position even in the event of grid failure.

## Integrated direct driven synchronous generator

The integrated multipolar permanent-magnet generator makes possible to create a technically simple but innovative design with an optimized efficiency. The generator reaches its nominal power already at a rotational speed of 12 rpm. This slow rotation keeps the acoustic power level low.

## Maintenance-friendly

By means of the integrated drive concept and using modern technology, a competitive wind turbine has been designed

## Yawing

The wind turbine is equipped with an electrical yaw system in order to align the machine cabin with the wind direction. The friction of the slide bearing units ensures absorption of external loads during yawing.

