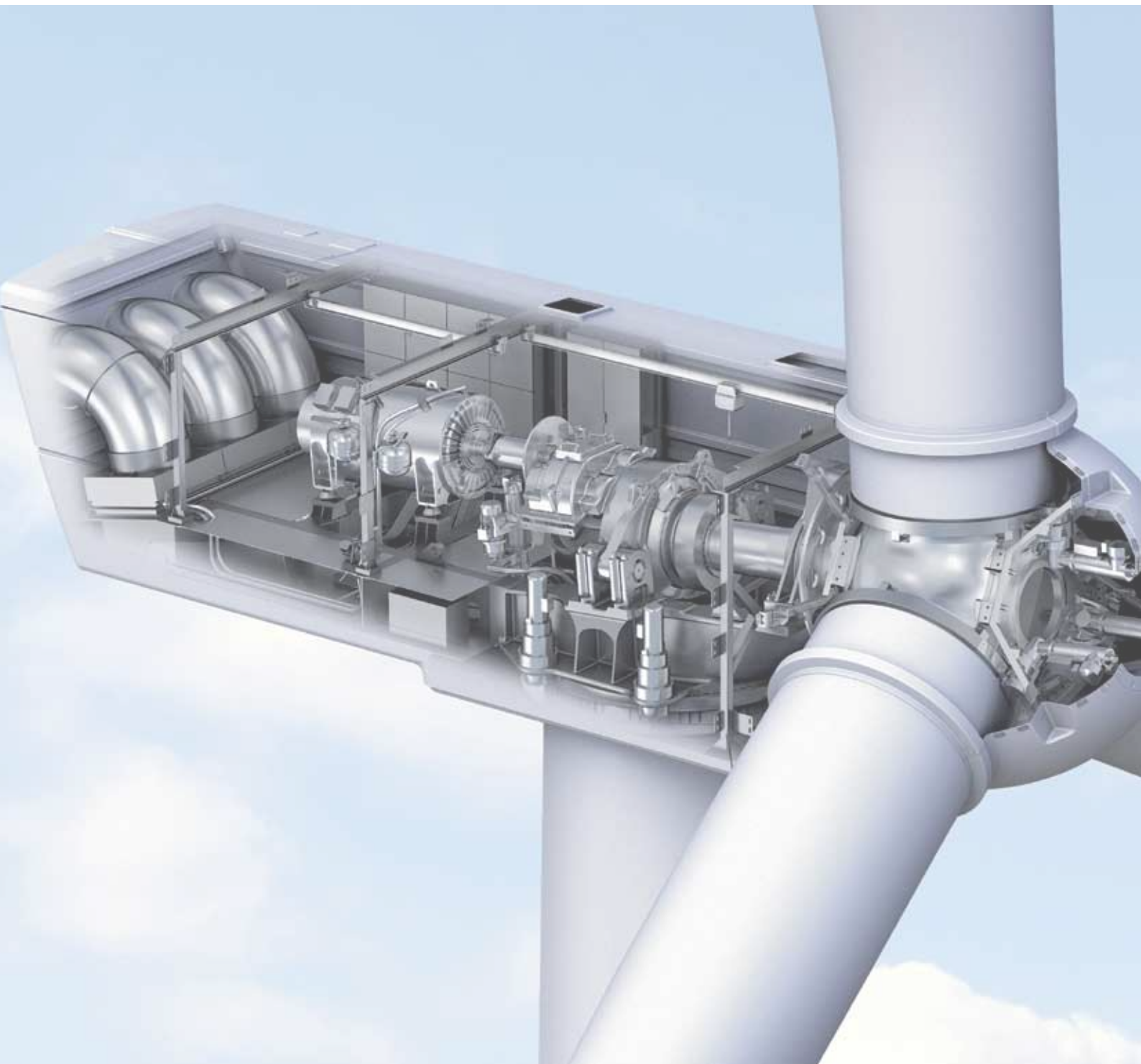


K110 2.4 MW





K110 2.4 MW

The K110 2.4 MW is a variable speed, pitch regulated wind turbine with the SYNERDRIVE TECHNOLOGY – an advanced distributed drive train and the unique electrical concept that is based on a full conversion system with an electrically excited synchronous generator.

Mature component design with demonstrated reliability is the basis for a proven and economic design with high availability for sustainable investment. Best possible component reliability that is crucial for the stable operation of wind turbine generator system is the integral element of the design of this wind turbine platform.

COMPONENTS

Rotor

The machine is equipped with an up-wind orientated rotor. The rotor blades are made of glass fibre reinforced plastics (GFRP).

Power regulation is realised by a full-span pitch system based on AC-technology with 3 independent drives for high system safety.

Drive train

The mechanical drive train is designed in 3-point arrangement (distributed drive train). The main bearing is a double row spherical roller bearing, taking the entire rotor thrust. The gearbox is a multiple stage system with planetary stages and one conventional spur gear stage.

An oil filtering and an efficient cooling system provide proper oil conditioning under operation. The system can optionally be equipped with a condition monitoring system for monitoring of main bearing, gearbox and generator condition.

A brake on the high speed side of the gearbox is used only below a rotational speed of 500 rpm, in order to bring the rotor to a complete stop if needed.

Electrical system

An electrically excited synchronous generator is combined with a full size IGBT-converter.

The converter system is based in the tower bottom to allow easy access by the service personnel.

The generator as well as the converter is water-cooled allowing a high ambient operation temperature environment.

The transformer is located in an additional housing close to the foundation or optionally on the tower base.

Nacelle and yaw system

Active yawing is realised via a ball bearing slewing ring with outside gearing that is fixed to the main frame and the tower top flange. Four yaw drives, consisting of high transmission planetary stages with AC-drives and motor brakes, are used for the alignment of the nacelle to the main wind direction.

This system is combined with a brake disc and hydraulically activated callipers for handling the torque on the machine head due to sudden change in wind direction.

Tower and foundation

The machine is available with different hub heights. Standard tower hub height is 95 m. A hybrid tower with 145 m hub height is also available.

The foundation is designed as flat and pile foundation depending on site-specific soil conditions.

ABOUT KENERSYS

KENERSYS is a renowned wind turbine manufacturing company with an in-depth knowledge in designing, manufacturing and marketing high-quality on-shore wind turbines.

The company was initially founded in 2003 as an engineering and consulting company, focused on the wind industry, providing wind turbine expertise, technical due diligences, turbine design and strategies for well-known manufacturers and component suppliers. In 2007 the company became part of the newly founded wind turbine manufacturer KENERSYS.

With the engineering team having 400 years of expert knowledge, the KENERSYS GLOBAL TECHNOLOGY CENTER, based in Muenster (Germany) comprises the most experienced and innovative specialists of the wind. The unique technical competence ensures quality and reliability for our customers and provides KENERSYS with a sound base for expanding its position in the wind turbine market.

K110 2.4MW



ROTOR

Swept area:	9331 m ²
Number of blades:	3
Blade length:	53.2 m
Blade material:	GFRP
Tilt angle:	5°
Cone angle:	2°
Rated speed:	12.8 rpm

PITCH SYSTEMS

Pitch bearing:	ball bearing slewing ring, externally geared
Pitch drives:	AC motors, angular gearboxes

DRIVE TRAIN

Principle:	3-point-support
Main bearing:	2-rows spherical roller
Gearbox type:	planetary / spur comb.
Rated torque:	approx. 1960 kNm

YAW SYSTEM

Type:	active wind orientation
Yaw drives:	4 motors with planetary gearboxes
Yaw brake:	hydraulic callipers with brake disk

GENERATOR-CONVERTER SYSTEM

Electrical system:	full conversion, electrically excited synchronous generator
Protection class:	IP 54
Converter voltage out:	600 V
Frequency:	50 / 60 Hz
Rated power:	2400 kW
Rated speed:	1500 rpm

Disclaimer: All numbers and figures are preliminary, indicative and subject to change. Nothing in this product brochure shall be understood or construed to be or to create an express or implied warranty or guarantee in respect of the product described herein.

MAIN DATA

Rotor diameter:	109 m
Installed power:	2400 kW
Power control:	pitch control
Operational mode:	variable speed
Presumed design life ¹ :	20 years
IEC type class:	S*/III
Turbulence class:	α
Certification:	acc. IEC 61400, ED. 3
Ambient operation temperature:	-20°C / +40°C

¹ Relates to main components only and excludes any components that are subject to normal wear and tear.

OPERATION DATA

Noise power level ² :	106 dB(A)
Cut in wind speed:	3 m/s (60 s average)
Cut out wind speed:	20 m/s (10 min average)
Re-cut in wind speed:	17 m/s (10 min average)

² Based on directive IEC 61400-1, noise reduced modes available.

TOWER

Height:	95 m (IEC S* / DIBt WZ2) and 145 m (IEC 3 / DIBt WZ2) hub height.
Type:	tubular conical steel segments, hybrid tower (145m)
Material:	S235/S355 construction steel, concrete/steel
Access:	internal climbing system or lift

* V_{mean} = IEC 3 / V_{extr.} = IEC 2

WEIGHT / MASSES

Rotor incl. hub:	approx. 62000 kg
Nacelle:	approx. 90000 kg
Tower:	depending on hub height
Foundation:	depending on soil condition, flat or pile foundation

POWER CURVE

Given for air density of 1.225 kg/m³ and based on the directive IEC 61400-12-1.

