

SolarTech Power Solutions

Constant speed wind power generation system



Overview

How does a constant speed wind turbine work?

A constant speed wind turbine operates at the maximum power point according to the wind conditions to control the active and reactive power of the machine. This is achieved through power electronics for machine control. The turbine may include a synchronous or induction generator.

What are the different schemes for wind power generation?

Different Schemes for wind power generation: CSCFS (Constant Speed Constant Frequency Scheme):- Constant speed drives are used for large generators that provide for the generated power to the grid. Generally synchronous generators or induction generators are used for power generation.

What type of generator can a variable speed wind turbine use?

Variable speed wind turbine with full-scale frequency converter. It may include a synchronous or induction generator. The machine control is performed with power electronics.

What are the control characteristics of wind speed?

In practice, different fluctuation characteristics of wind speed, such as the average value, fluctuation frequency, and fluctuation amplitude, will affect the dynamic tracking effect, power generation efficiency, and system stability. Table 3. Comparison of control characteristics for various MPPT methods High cost. Low system reliability.

How do wind turbines control rotary speed and grid frequency?

In constant speed wind turbines, the control system decouples the rotary speed and grid frequency. This means that the wind turbines cannot provide corresponding active power when grid frequency varies, reducing the inertia of the whole power grid.

How is a wind turbine controlled?

The conventional control of a wind turbine involves regulating the power yield and rotor speed. In above-rated wind conditions, the generator power should be as close as possible to the rated value. In below-rated wind speeds, the rotor speed should 'track' the wind speed to gain maximum energy yield.

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