Wind turbine generator speed sensor

What is a turbine speed sensor?

The turbine speed sensor is a critical component in various turbine-based systems,including gas turbines,wind turbines,and steam turbines. Its primary function is to accurately measure the rotational speed of the turbine,providing essential data for control,monitoring,and safety purposes.

What is a wind speed sensor?

In a connected context, wind speed sensors are a critical component of wind farms and are extensively utilized to enable wind energy monitoring, control, and decision support for wind turbines [4]. These sensors measure wind speed, thereby playing a pivotal role in determining the operational performance of wind turbines.

Can virtual sensors be used for wind turbines?

One of the earliest studies for the virtual sensors for wind turbines is for the wind speed signal,1 where multi-layer perceptron (MLP)-based artifical neural networks (ANNs) is shown to be the best performer out of the four data driven algorithms applied.

Why do wind turbines need a wind speed sensor?

WTGs rely on accurate wind speed measurements for safe and efficient operation. However,physical wind speed sensors are prone to inaccuracies and failures due to environmental factors or inherent issues,resulting in partial or missing measurements that can affect the turbine's performance.

Can DT be used as a virtual sensor for wind turbine generators?

The comparison between the estimated wind speeds and the real wind speeds demonstrates the effectivenessof DT as a virtual sensor for wind turbine generators. The estimated wind speeds exhibited a close agreement with the real wind speeds within 80% for the given generated power values.

What are the emerging trends in wind turbine sensor data?

Emerging trends in wind turbine sensor data go beyond process-related matters. Data collected from wind turbines is now being used to create digital twinsof turbines and other wind farm components. Digital twins can be used to create simulations and help in decision-making processes.

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