

Direct drive wind turbine generator weight

What are direct-drive generators for wind turbines?

Direct-drive generators for wind turbines are high torque, low speed machines which require a heavy robust structure to maintain the air-gap clearance open and stable. The mass of the structural material can be assessed at the early stages of the design process for radial-flux generators.

How much power does a direct-drive wind turbine generate?

The total generator mass of 1.5 MW (Zephyros), 4 MW (NewGen) and 4.5 MW (Enercon) direct-drive wind turbines are also addressed in Fig. 12. The ratios of m/T for the 1.5 MW and 4.5 MW generators, which are 46.4 and 66.5 kg/kNm, are higher than the theoretically optimized 2, 3 and 5 MW concepts.

What is the largest direct-drive wind turbine?

A. Conventional structure The largest direct-drive wind turbine is E-112 model (4.5 MW, EESG DD) of Enercon GmbH as shown in Fig. 6. The generator mass and diameter are about 220 ton and 12 m, respectively. The optimization of conventional PMSG DD concept with different generator powers has been achieved for the mass minimization in .

What are the advantages of a direct-drive wind generator?

The generator is fully integrated in the structural design. The advantages of this design are the relative big diameter, and the load path follows contrary to the traditional designs with a main shaft hence reduces mass. Fig. 10(a) shows mechanical structures of direct-drive wind generators which have been proposed by Spooner et al .

This, in turn, significantly increases the generator volume and weight and as a result, a stronger and more expensive tower structure is required for direct-drive wind turbines.

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Abstract- The objective of this paper is to review direct-drive and geared generator systems and to identify suitable generator concepts for direct-drive wind turbines. The comparison of ...

For example, the radial-flux, direct drive, rare-earth permanent magnet (RE-PM) electric generator of the twelve megawatt Haliade-X wind turbine from GE is approximately 11 meters (or 36 ...

However, the rotor of DD-generators in a wind turbine operates at a low speed requiring a higher torque than geared generators with much faster speeds to generate the same power. As a result, the ...

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With the main aim of coming up with an efficient methodology for the design of large direct-drive wind turbine electrical generators that minimises the structural mass and the structural ...

A direct-drive generator for large-scale wind turbine provides higher energy density in comparison with a gear train type generator. An AFPM (Axial Flux Permanent Magnet)-type machine ...

A direct drive wind turbine converts rotor rotation to electrical power directly, without the use of a gear box. Traditional wind turbines use gearboxes to step up the rotational speed (about 100x) from the ...

Reduced complexity, outstanding performance The Siemens 6.0-MW wind turbines of the D6 platform embody tried and tested innovation in the field of direct drive generators, with hundreds of units ...

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