

A wind turbine spins a shaft connected with the Magnetodynamic Heater inducing strong Eddy currents inside the device that heats its internal elements and the water in contact with them. The device has dual purposes: it heats the water and also works as a pump at the same time. ... making solar heating system useless. It is an alternative in ...

EDDY CURRENT HEATER 3.1 | Principle of magnetic eddy current heating The heat in a magnetic eddy-current heater comes mainly from the power generated by the eddy currents in the metal TABLE 1 Efficiencies of different wind power generation system [6]. Component Efficiency Capacity factor-

1 Introduction. Wind energy presents a giant potential for conversion into other forms of useful energies. The most common type of wind systems assures the conversion of wind energy into electricity [1, 2]. This paper proposes a conversion system of wind energy into thermal energy by means of a permanent magnet eddy current heater (PMECH).

This proposed high-efficiency wind-magnetic eddy current heater design demonstrates enhanced wind energy utilization and provides a valuable framework for future applications in wind ...

This paper deals with the simulation and optimal design of a permanent magnet eddy current heater (PMECH) driven by wind. Solid steel, closed-slot, and open-slot PMECH are proposed, and corresponding 2D finite ...

Augmented wind power generation system using an antecedent atmospheric sensor and method of operation DE202008010970U1 (en) 2008-08-18: 2008-12-11: Pfeiffer, Bernd, Dipl.-Ing. ... Eddy current heating using wind power WO1996029845A1 (en) * 1995-03-17: 1996-09-26: Enviro Ec Ag: Device for heating a medium

Eddy current losses in wind power generation systems are dissipated as heat, which has a direct impact on the generator's efficiency. Due to the induction generator's poor heat dissipation from the rotor, eddy-current losses may generate substantial heating. A precise combination of the rotor architecture and the lamination dimensions should be ...

etic poles and material parameters of the conductor is analytically derived. The maximal heat generation is given by a simple function of the conductor radius, rotational speed ...

A superconducting magnetic eddy current heater (SMH) is proposed for the characteristics of wind thermal power generation system, which uses non-resistive, large current-carrying superconducting coils for excitation, and has high output efficiency and power density.

Distributed heat sources (DHSs), such as electric boilers and heat storage, offer an effective way to enhance

wind power penetration in a combined heat and power system by reducing the electric ...

In this research, eddy current heaters are selected to be investigated for wind-to-heat conversion due to their potential for high-temperature heat generation at low rotational speeds.

In this paper, we study the input torque of a permanent magnet eddy current heater (PMECH) as the main important parameter to generate heat directly from wind energy. The PMECH contains a metallic stator, which acts ...

Semantic Scholar extracted view of "Effects of intermittent heating on an integrated heat and power dispatch system for wind power integration and corresponding operation regulation" by Jinfu Zheng et al. ... This paper presents an interior permanent magnet eddy current heater (IPMECH) that can be driven by wind turbine, which can realize the ...

The reason is, direct eddy-current heating is a little different than induction heating. The inductor in that case is effectively a primary winding of a transformer, with its own electrical ...

A superconducting magnetic eddy current heater (SMH) is proposed for the characteristics of wind thermal power generation system, which uses non-resistive, large current-carrying ...

Moreover, due to their size and cost, existing eddy current heaters may be unsuitable for smaller domestic heat generation systems. Rotaheat, a UK-based company, has recently been granted a UK patent (GB2532443) for a new design of eddy current heater, which is easy and inexpensive to store, and offers a highly efficient solution for the ...

Based on the law of electromagnetic induction and eddy current phenomenon, this paper establishes a model of permanent magnet eddy current heating device, and then ...

This paper proposes an outer rotor permanent magnet eddy current heater (ORPMECH) for wind turbines. The main features of this device are the following: compactness, easy control of ...

Permanent magnet eddy current heating as a new type of wind energy utilization method, which is energy-saving, is zero-emission, and involves no pollution and a high utilization of wind energy, has attracted more and more attention. This paper deals with the simulation and optimal design of a permanent magnet eddy current heater (PMECH) driven by wind. Solid ...

The eddy-current field in the conductor is governed by $(-k^2 + \gamma^2) B = j\omega B$. Consequently, the Joule heating in the cylindrical conductor per unit width (in the z-direction) is $W = A$. Traveling wave approximation Fig. 2(a) is a schematic of an induction heating system driven by wind power, where rotating magnetic poles induce ...

Wind power eddy current system heating

Analysis of a Permanent Magnet Eddy Current Heater Driven by a Wind Turbine . Tiberiu TUDORACHE. 1, Leonard MELCESCU. 1 ... The classical wind power systems are typically used to

A wind thermal power generation system based on magnetic eddy current heating is constructed, in which the magnetic eddy current heating device adopts superconducting induction heating method and u...

An "eddy current heater". Source: [9] Because high temperatures are needed to produce electricity efficiently with a steam turbine, these systems can't make use of joule machines or hydrodynamic retarders, but instead rely on a type of retarder called an "eddy current heater" (or "induction heater").

Changing the magnetic field on a conductor metal can induce eddy currents, which cause heat generation. In this paper, we use this idea to convert wind energy into thermal energy directly. This system contains a vertical axis ...

Table 1. Main equipment for heat stirring system. Device name Number Model and main performance parameters Electric machinery 1 YVP100L-4 50 Hz 2.2 kW

The results of experimental and analytical studies of the wind energy system with permanent magnet eddy current heater are presented. Power generated in the ferromagnetic ...

The eddy current, Joule heat and input electrical power of a permanent magnet type eddy current heater based on cylindrical Halbach arrays to reduce the viscosity of crude oil in oil wells were ...

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