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VORTEX CONVERTER OF CONTINUOUS MEDIUM FLOW

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The problems of conversion of solar and wind energy, as well as the use of hydro energy laminated swirling flows can play an important role in connection with the thermal-hydraulic feature of these trends, concentrating in the swirl jet flows kinetic energy scattered in the surrounding area. This allows the use of low-potential thermal ascending flow induced by solar heating, weak wind and kinetic energy flows in rivers and water channels.

The article presents the materials on the development of the power plant transforming ram wind flow into jots making it possible to use low wind and low-potential upward heat flows. The vortex wind power plant (VWPP) can use low-potential air currents moving in the atmosphere and water areas with 3-4 m/sec velocity, utilize heat flows discharged into environment by industrial, as well as to transform solar and geothermal energy in the form of thermoinduced upward air currents. The plant transforms uniform wind flow into vortex-like currents, concentrates wind power and organizes and accumulates wind energy distributed in large space, is concentrated to extremely high degree in compact nuclews of a tornado. The wind plant can automatically adjusted to real velocity of ram air flow at calculated values of rotating speed of the electric generator of the wind power plant, which provides high-effiency energy transformation with a wider range of wind velocities. Existing wind power plants have operating range of wind velocities from 6-15 m/sec to 20-25 m/sec. VWPP makes it possible to expand operating range of wind velocities flow 3-4 m/sec to 60 m/sec and more primarily due to modular construction of wind corverters.

The VWPP advantages:

- size, weight and operation wind velocity are 1,5-2 times lower;
- generator-rotor does not have any shaft and the “setup for the wind system;
- the plant configuration is modular - it is assembler of identical function modules;
- stabilization of rotor speed is provided by changing the area of the plant air intake;
- wind energy efficiency is $\xi \approx 0,3$; specific speed $Z = 1.5\text{-}2,0$.