

Experimental study on energy performance of clean air heat pump - DTU Orbit (08/11/2017)

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An innovative clean air heat pump (CAHP) was designed and developed based on the air purification capacity of regenerative silica gel rotor. The clean air heat pump integrated air purification, dehumidification and cooling in one unit. A prototype of the clean air heat pump was developed to investigate its energy performance. Energy consumption of the prototype of CAHP was measured in laboratory at different climate conditions including mild-cold, mildhot and extremely hot and humid climates. The energy saving potential of the clean air heat pump compared to a conventional ventilation and air-conditioning system was calculated. The experimental results showed that the clean air heat pump saved substantial amount of energy compared to the conventional system. For example, the CAHP can save up to 59% of electricity in Copenhagen, up to 40% of electricity in Milan and up to 30% of electricity in Colombo in summer compared to the conventional ventilation and air-conditioning system that are commonly used in those regions.

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Authors: Fang, L. (Intern), Nie, J. (Intern), Olesen, B. W. (Intern)

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