

AIR CONDITIONER USING WATER VAPOR REFRIGERANT FOR MODULAR DATA CENTER AND DATA CENTER COMPRISING SAME

ABSTRACT

The present application relates to an air conditioning using a water vapor refrigerant for a modular data center and a data center comprising the same. The air conditioner using a water vapor refrigerant for a modular data center in the present invention comprises a box body and an air conditioning system. The air conditioning system comprises heat exchangers, water atomization apparatuses, an air circulation side fan and a vapor side fan. Each heat exchanger is provided with a plurality of columns of bidirectional micro-channels on both sides; the water atomization apparatuses cooperate with pressure regulation apparatuses to form vapor; the vapor side fan is used for forming a negative pressure, such that the vapor evaporates under the negative pressure in a C-D direction and absorbs heat in the heat exchangers so as to achieve refrigeration; and the air circulation side fan is used for sucking, into the micro-channels of the heat exchangers and in an A-B direction, air in a space needing to be cooled, such that after heat exchange in the micro-channels is completed, the air is discharged into the space needing to be cooled. The beneficial effects are as follows: water vapor is used as a refrigerant and can evaporate under a negative micro-pressure to achieve refrigeration; a refrigeration apparatus does not need to use a compressor to drive a refrigerant cycle, such that the complexity of a device is greatly reduced; and the structure is simple, the energy consumption is low, the cost is low, the refrigeration efficiency is high, and the manufacturing cost and the running cost are reduced.

Fig. 1