International Journal of Engineering and Management Research e-ISSN: 2250-0758 | p-ISSN: 2394-6962
Volume-13, Issue-3 (June 2023)
https://ijemr.vandanapublications.com https://doi.org/10.31033/ijemr.13.3.10

Water Circulation Based Low Power Consumption Air Conditioner

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Received: 03-05-2023 **Revised:** 21-05-2023 **Accepted:** 05-06-2023

ASBTRACT

This abstract introduces a novel air conditioning system that utilizes water circulation to achieve reduced power consumption. Traditional air conditioners consume significant amounts of energy, leading to high electricity bills and environmental concerns. In this system, water is utilized as a cooling medium instead of refrigerants, offering a more sustainable and energy-efficient approach. Normally water not used as refrigerant but we have used it because it can work for both as air conditioning as well as chiller. Water is second refrigerant mostly used for larger and more complex HVACR application .R134a (hydrocarbon) gas is used for heat transfer for home cooling. Preliminary tests of the water circulation achieved significant reductions in power consumption compared to traditional compressor-based air conditioners, while maintaining satisfactory cooling performance. This innovation holds great potential for improving energy efficiency and reducing environmental impact in the field of air conditioning, contributing to sustainable and eco-friendly cooling solutions. Water cooled chillers use water as a refrigerant instead of toxic chemicals which makes it safer and environment friendly.

***Keywords*--** Energy Saving, Water Circulation, Low Current, Air Conditioner

I. INTRODUCTION

The water circulation-based low power consumption air conditioner is an innovative cooling system designed to minimize energy usage while providing efficient and effective cooling. This system utilizes water circulation to enhance the cooling process and reduce the reliance on traditional refrigerants.

When the air conditioner is operational, water is circulated from the reservoir through the pipes, absorbing heat from the surrounding air. The warm water is then pumped back to the reservoir, where it releases heat and cools down before being recirculates. This continuous water circulation process helps maintain a consistent cooling effect while minimizing energy consumption.

Overall, the water circulation-based low power consumption air conditioner offers an energy-efficient alternative to conventional cooling systems, providing effective cooling while reducing environmental impact**.**

II. WORKING

The water circulation-based low power consumption air conditioner operates by utilizing water as a heat transfer medium (as secondary refrigerant) to achieve efficient cooling. Here is a simplified explanation of how it works:

- Water Reservoir: The system includes a water reservoir that stores a certain amount of water. In which water is cold by the action of refrigeration action.
- Water Pump: A pump is employed to circulate the water throughout the system. It draws water from the reservoir and pushes it through the network of pipes (AC Indoor unit).
- Evaporator Unit: The network of pipes distributes the water to the evaporator unit, which is typically located inside the conditioned space or the area that needs to be cooled.
- Heat Absorption: As warm air from the surrounding space passes over the evaporator unit, the water circulating inside the pipes absorbs the heat from the air. This heat transfer process cools down the air.
- Cooled Air Release: The cooled air is then released into the conditioned space, providing the desired cooling effect.
- Return of Warm Water: After absorbing heat from the air, the now warmer water is pumped back to the water reservoir.
- Heat Dissipation: In the water reservoir, the warm water releases heat in the water tank. In the tank the warm water to cool down by refrigeration action and cold water is re-circulated in close cycle. This cycle continuous dissipate the heat collect by (Indoor fan unit).
- Continuous Circulation: The water pump continues to circulate the water, repeating the process of absorbing heat from the air, cooling it down, and returning it to the reservoir.

The continuous water circulation in the system ensures a consistent cooling effect while reducing energy consumption compared to traditional air conditioners that rely solely on refrigerants. By harnessing the high specific heat capacity of water, this design optimizes the heat transfer process, resulting in a more efficient and eco-friendly cooling solution.

III. MAIN COMPONENTS LIST

(A) Compressor
(B) QUARTER 1/4 Copper Pipe 2.5 kg
(C) Capillary Tube 0.36 Number
(D) Copper Condenser
(E) Fan Motor
(F) Water Pump
(G) Filter
(H) Ac Indoor
(I) Water storage tank
(J) R134a gas

IV. CONCLUSION

A water circulation-based low power consumption air conditioner has several key conclusions:
1. Energy Efficiency: The system utilizes water circulation as a primary method of cooling, which significantly reduces power consumption compared to traditional air conditioning units. The water helps absorb and dissipate heat, allowing for more efficient cooling.
2. Environmental Friendliness: With reduced power consumption, the air conditioner contributes to no toxic emissions and helps mitigate the environmental impact associated with energy-intensive cooling systems. Additionally, using water as a cooling medium avoids the need for harmful refrigerants like ammonia, commonly found in conventional air conditioners.
3. Cost Savings: The low power consumption translates into cost savings for the user. By reducing energy usage, the water circulation-based air conditioner can help lower electricity bills, making it an economically attractive option for both residential and commercial applications.
4. Improved Comfort: The system provides effective cooling while maintaining a comfortable indoor environment. Water circulation helps regulate humidity levels, preventing excessive dryness or moisture build up, which can improve overall comfort and reduce the need for additional humidifiers or dehumidifiers.
5. Maintenance and Durability: The water circulation-based air conditioner typically has fewer moving parts compared to traditional units, resulting in lower maintenance requirements and potentially longer lifespan. This can lead to reduced maintenance costs and increased reliability over time.

Overall, a water circulation-based low power consumption air conditioner provides an energy-efficient, environmentally friendly, cost-effective, and comfortable cooling solution with potential maintenance advantages.

FUTURE SCOPE

The future scope of AC is subject to ongoing research, technological advancements, and market trends. These developments aim to provide more energyefficient, environmentally friendly, and comfortable cooling solutions for various applications, while also considering factors such as cost-effectiveness and sustainability. The future scope of the project is that the project can be modified as a water cooler by passing the water over primary refrigerant and can be modified as a water heater by passing over the condenser unit.

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