



## TECHNOLOGY

# Multifunctional Variable Refrigerant Flow System with a Thermal Energy Storage

## OVERVIEW

### Background:

Commercial and residential buildings account for the majority of energy consumption in the United States. Therefore, there has been a great effort to improve the performance of cooling and heating systems in both residential and commercial buildings. The variable refrigerant flow (VRF) system is one of the most energy efficient cooling and heating systems. A multifunctional variable refrigerant flow (MFVRF) system provides space cooling, heating, and hot water to a building simultaneously. However, the current MFVRF system providing hot water has several limitations. Such as, the usage of the hot water system is relatively low as compared to the indoor units? thermal demands. For most of the time, the hot water system would be in standby mode. The system needs to have a defrosting cycle in the heating season. The heating capacity of the system would be influenced by the defrosting operation. When the ambient temperature is extremely low, the performance of the system would be degraded.

### Innovation:

Researchers at the University of Maryland have designed a Multifunctional Variable Refrigerant Flow System with Thermal Energy Storage. This design is proposed to improve the energy efficiency of multifunctional variable refrigerant flow system by integrating a thermal energy storage concept. The proposed concept can be applied to residential and commercial air conditioning system and improve system performance and meet the smart grid implementation requirements.

## APPLICATIONS

- HVAC Systems

## ADVANTAGES

- Reduced power consumption of the outdoor unit
- Improved efficiency

## CONTACT INFO

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## Additional Information

### INSTITUTION

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### PATENT STATUS

Pending

## **CATEGORIES**

- Industrial Processing

## **EXTERNAL RESOURCES**

### **DOCKET CODE**

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