

How can a fuzzy logic controller reduce energy consumption and maintain thermal comfort?

The proposed control technique effectively minimizes energy consumption and operating costs while maintaining thermal comfort. Fuzzy logic controller. A combination of fuzzy and feedforward approaches to control a hybrid TES was applied for shifting the heating load during the peak period.

Can model predictive control strategies be used in active thermal energy storage systems?

They categorized the control approaches based on the system's size and storage material to detect the gaps in the literature. A throughout review on using model predictive control strategies in active thermal energy storage systems was proposed by Tarragona et al. , highlighting the recent efforts to overcome the computational issues.

Can thermal energy storage be integrated into low-temperature heating & high- temperature cooling systems?

The present review article examines the control strategies and approaches, and optimization methods used to integrate thermal energy storage into low-temperature heating and high-temperature cooling systems. The following are conclusions and suggestions for future research and implementation in this field:

How does a new air conditioner control battery temperature?

The increased cooling capacity of the air conditioner also means that the ability to control the battery temperature is reduced, leading to an increase in battery temperature. The control effect of the new system proposed in this paper on this supply imbalance is achieved by changing the evaporating pressure, as shown in Fig. 6.

Can fuzzy logic control be used in domestic refrigeration systems?

There is very little information in the literature regarding the application of fuzzy logic control in domestic refrigeration systems. Among the works found, Bung-Joon et al. developed a controller model based on fuzzy logic and neural networks to improve the performance of the internal temperature of the refrigerator.

What control strategies are used in refrigeration?

In recent years, different control strategies have been used in the field of refrigeration, these range from the study of system behavior to the implementation of control algorithms to improve energy efficiency, and thus, seek better-operating conditions .

A new fuzzy-logic-based control of a smart home with an air conditioner, an electric vehicle, and an inverter-interfaced battery energy storage system is proposed. o The smart home provides active and reactive power flexibility services for ...

Energy Savings for Air Conditioning System Using Fuzzy Logic Controller Design for Northeastern Nigeria.

Maxwell Francis. ... Fuzzy Logic Control of Air Conditioners Amiya Patanaik Roll number 05EG1008 Department of Electrical Engineering Indian Institute of Technology, Kharagpur - 721302, India E-mail: amiyain@gmail Abstract Air ...

Most of the energy used in residential buildings originates from air conditioners. Meanwhile, air conditioner manufacturers are addressing this issue by the production of efficient air conditioners.

Masjuki HH, Mahlia TMI, Choudhury IA. Potential Electricity Savings by Implementing Minimum Energy Efficiency Standards for Room Air Conditioners in Malaysia. *Energy Conversion & Management*. 2001; 42: 439-450. Nasution H, ...

The paper presents the algorithm for intelligent air conditioner controller. This algorithm is based on fuzzy logic. The implementation is done on arduino based microcontroller with temperature ...

In this paper a scheme has been proposed to maintain the temperature and the humidity, in each of the rooms served by a central Air Conditioner (AC) unit, close to the targeted values, and reduce the electrical energy intake of the AC compressor. The upper limits of the comfort zone, typically marked at a temperature of 25 °C and a relative humidity of 70%, are ...

Control Strategy for Inverter Air Conditioners under Demand Response ... Air conditioning loads are important resources for demand response. With the help of thermal energy storage capacity, they can reduce peak load, improve the reliability of power grid operations, and enhance the emergency capacity of a power grid, without affecting the comfort of the users.

Semantic Scholar extracted view of "Fuzzy logic control of air-conditioning system in residential buildings" by A. Attia et al. ... presents an implementation of fuzzy controller with different number and shapes of membership functions for smoothing energy consumption of an air conditioning load while dealing with thermal disturbances and shows ...

The invention relates to a programmable logic controller (PLC) system for an ice cold storage central air-conditioner. The system mainly comprises a lower computer and an upper computer, wherein necessary accessories such as a communication equipment interface, a network card and a modem are arranged on each of the lower computer and the upper computer, so that ...

MPC is an advanced form of advanced control strategy for process control, with the basic principle of satisfying constraints. It comprises a model, an optimizer solver, and a predictive range for generating a process's control trajectory [10]. MPC can save energy and improve control performance, accuracy, stability, and anti-interference ability.

Simulation Study of the Control Strategy of a DC Inverter Heat Pump Using a DC Distribution Network.

Siwei Han 1,\*, Xianglong Li 2, Wei Zhao 1, Linyu Wang 1, Anqi Liang 2, Shuang Zeng 2. 1 State Grid (Suzhou) City and Energy Research Institute, Suzhou, China 2 Electric Power Research Institute of State Grid Beijing Electric Power Company, Beijing, China

This paper studies the limitations of AC load shifting and the attractiveness of using thermal energy storage (TES) to increase residential demand response potential. A general building ...

Fuzzy logic control was developed to control the compressor motor speed, fan speed, fin direction and operation mode to maintain the room temperature at or closed to the set point temperature and save energy and keep devices from damage. This paper describes the development of Fuzzy logic algorithm for Air Condition control system.

Based on the VESS, the temperature control strategy was designed to reduce the power consumption of the ACs when making sure the room temperature is below the permissible limit. An artificial neural network (ANN) model was designed to predict the energy capacity of ACs, using which the VESS is achieved. ... Virtual energy storage model of air ...

To improve energy efficiency in multi-unit air conditioners, a fuzzy logic control method is employed to manage the operating ... (VRV) and cool thermal energy storage (CTES) air conditioning (A/C ...

Room Air Cooler Using Fuzzy Logic Control System" International Journal of Scientific & Engineering Research Volume 2, Issue 5, May-2011 ISSN 2229-5518. ... "Microcontroller-Based Energy Saving Control for Air - Conditioning System Using Fuzzy Logic Approaching: An Overview" 2006 IEEE. [6] M. Mongkolwongroj and V. Sarawit ...

ECO Mode with AI Control auto-adjusts the air conditioner to the optimal level based on heat load conditions and air-conditioning capacity. ECO + AI air conditioner: 20% energy saving: Sa: Equipped with AI Auto Cooling, the air conditioner can automatically optimize its various modes by analyzing the room conditions and usage patterns.

An inverter air conditioner adjusts the speed of the compressor by adjusting the power supply frequency through a frequency converter to realize the control of compressor ...

The energy-saving research in air conditioners focuses mostly on the chiller system and the associated control strategies. For air conditioners in buildings, the thermal control strategy to adjust ...

The complex coupling between the direct-cooling battery thermal management system and the vehicle air conditioner system affects its application. This paper designs a dual-VOVs (Variable Opening Valves) system. The temperature control decoupling of the battery and cabin is achieved by regulating the VOVs to change the evaporating pressure of the battery ...

Masjuki HH, Mahlia TMI, Choudhury IA. Potential Electricity Savings by Implementing Minimum Energy Efficiency Standards for Room Air Conditioners in Malaysia. *Energy Conversion & Management*. 2001; 42: 439-450. Nasution H, Wan Hassan MN. Energy Saving for Air Conditioning by Proportional Control, Variable and Constant Speed Motor Compressor.

Nearly 30%-40% of the total energy consumption of a building is attributed to heating, ventilation, and air-conditioning (HVAC) system (P&#233;rez-Lombard et al., 2008, Dung et al., 2014, Oropeza-Perez, 2016, Qiu et al., 2019). The air-conditioning system of HVAC in factories can regulate indoor air to provide comfort, air quality, and a safe working environment.

The inverter AC, as a typical demand response resource, is constructed as a power type battery model (PTBM) and a capacity type battery model (CTBM) according to the different control ...

Fuzzy Logic Control of Air Conditioners Amiya Patanaik Roll number 05EG1008 ... This translates to huge energy and monetary saving in terms of reduced compressor/fan duty cycle. In the developed ...

The term variable refrigerant volume (VRV) system was first introduced in 1982 and is also known as a variable refrigerant flow (VRF) system nowadays [1]. Since the 1980s, VRF systems have been widely used in Japan: 50% of midsize office buildings (up to 6500 m<sup>2</sup>) and 33% of large commercial buildings (more than 6500 m<sup>2</sup>) [2]. VRF systems have been ...

DOI: 10.1109/ACCESS.2020.3005054 Corpus ID: 220366603; Fuzzy Logic-Based Direct Load Control Scheme for Air Conditioning Load to Reduce Energy Consumption @article{Shah2020FuzzyLD, title={Fuzzy Logic-Based Direct Load Control Scheme for Air Conditioning Load to Reduce Energy Consumption}, author={Zeeshan Ali Shah and Hatem ...

The application of fuzzy logic to air conditioning systems based on vapor compression has been extensively studied to control temperature and humidity. This has resulted in better comfort conditions. Research in this area ...

PDF | On Jan 1, 2009, C Ahilan and others published Design and implementation of fuzzy logic controller for an air conditioner with energy saving | Find, read and cite all the research you need on ...

Abstract: The energy storage property of the air conditioning system are studied firstly, based on which, the energy storage model for air-conditioning system is put forward. Then, the air ...

As representatives of TCLs, air-conditioners (ACs) hold a significant share in DR due to the following reasons: 1) ACs can store both heat and cold, exhibiting excellent energy storage capabilities; 2) ACs are transferable loads and constitute a substantial proportion of TCLs [5]. Considering the aforementioned merits,

ACs demonstrate a more ...

Firstly, the control strategy of energy storage system based on threshold method considering electric storage capacity is proposed, and the dynamic changing process of air conditioning system ...

The proposed controller has the adaptive nature to control fan and compressor speed which leads to reducing power consumption and the system controls the operation mode to retain the healthy oxygen level and humid condition of the indoor environment. In efficient air cooling systems may cause of wasting energy in a great amount specially in the urban area. ...

Buildings are one of the largest consumers of energy worldwide due to the intense use of air conditioning. In China, building energy consumption accounts for one-third of the total energy consumption [1, 2] the United States, the primary energy consumption of buildings accounts for 41% of the total energy consumption [3, 4].According to "International ...

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