

## **TOTAL OPTIMAL OPERATION FOR HVAC SYSTEM WITH HEAT SOURCE AND DISTRIBUTION SYSTEM**

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### **ABSTRACT**

Operation of building systems after occupancy is getting to be recognized as a key issue for substantial reduction of energy use and CO<sub>2</sub> emission. Especially optimal operation of HVAC systems is very important because of their large energy consumption. Many methodologies for the purpose have been proposed, however most of the reported results are based on the simulation with the assumption that the performance of each component and subsystem is known or prescribed. In this paper an optimal operation scheme of HVAC systems for existing buildings is proposed and the test results of applying the scheme in a real office building are shown and investigated. The scheme is divided into two steps: the first is to identify the parameters of the mathematical model of each component such as a fan, a pump and a heat pump, and the second is to optimize total energy consumption of HVAC system operation. Mathematically the second step is a non-linear optimization process which is to be embedded into a BEM system.

### **KEYWORD**

Optimization, Identification, Simulation, HVAC, BEM system, Energy saving, Methodology test.

### **MODEL IDENTIFICATION**

Operation of building systems is increasingly to be recognized as a key issue for substantial reduction of energy