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Predicting the annual escalator energy consumption based on short-term measurements

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Abstract

This article presents a novel approach for the annual energy consumption estimation in escalator technology. The method is based on short-term energy measurements of several day types within a week. It is best suitable for appliances where the passenger flow is weekly recurring. This article explores the implication of the method with seasonal changes, as well as stresses the impact of various day types and holidays on annual energy consumption estimation. The performance of the proposed method was compared with the existing approaches of energy consumption estimation in the standard ISO 25745-3 and annual energy measurement results. The approach is favorable among other existing approaches because it does not require additional passenger measurements, while providing more accurate results.

1. Introduction

An escalator is one of the best ways to transport a large mass of people from one floor to other levels of a building. The escalator is a very popular means of vertical transportation, especially in commercial and transportation buildings. In department stores, the escalator serves as a center of attraction, and the most desirable places are located in line or near the escalators. Often, the escalator increases the revenue of a commercial building by exposing and connecting the floors to customers more efficiently. Escalators are also found in various

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