



## Investigations of air-side short circuit on CAV AHU in Thailand

D Woradechjumroen<sup>1,\*</sup>

<sup>1</sup>School of Engineering, Sripatum University, 2410/2 Jatujak, Bangkok, 10900, Thailand

\* Corresponding Author: denchai.wora@gmail.com, denchai.wo@spu.ac.th

**Abstract.** One of the most important problems in Thailand is a humidity condition which caused by improper operations of an air-conditioning system in commercial buildings; air-side short circuit is one of the issues causing poor air circulation in the zones. As a result, zone air temperature cannot naturally return to the air-handling unit (AHU) room causing high humidity condition and mold. Also, this issue affects the low different water temperature problem resulting in excessive power consumptions of a chiller plant system. The AHU system is well installed, and has standardized commissioning (Cx) system in developed countries. In contrast, in developing countries, a Cx process is typically conducted based on air-conditioning contractors, which lack of experience and well-trained proficiency. To this end, the paper focuses on the investigations of malfunction a constant air volume (CAV) system; rule-based functions are developed based on data logger and problems from site survey. After that, heat transfer theory is used to generate rule-based laws, and is simplified in terms of linear relations. To validate the air-side short circuit detection law, an example building has installed sensors according to rule-based function design. The results show that obtained data can assure the applicable rules for CAV AHU air-side short circuit problems. In addition, the rule-based functions can be used to further design fault detection and diagnosis (AFDD) functions in future research.

**Keywords:** Automated fault detection and diagnosis; Air-side; AHU; CAV; Commissioning