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【摘要】

本研究以CFD氣流模擬分析方法解析附旁路風門可變風量送風機系統內流場及溫度場分佈情形，並針對旁路風門尺寸之影響。此外，由於旁路風門的大小與擺設位置將直接影響回風混合均勻與否與出風溫度變化，因此有關VAV送風機之研究。

在數值模擬包括以三種不同的旁路風門尺寸與不同的擺設位置進行模擬解析，試圖以此方法尋找出旁路風門最佳尺寸特性不僅可增加循環風量及空氣混合度，亦可藉由風門開度控制來提高出風溫度，使VAV送風機出回風溫度差降低。當室內負載穩定時，系統將調整風機維持於最低送風量，此最低送風量可使室內空氣之循環率維持在規範的最低限產生傾瀉現象問題，並達到VAV送風機之節約能源及兼顧舒適度之目的。

【英文摘要】

This study analyzed the distribution of internal flow and temperature fields of the Damper Bypass VAV Fan-Coil Unit. The effects of bypass damper opening to the distribution of air flow and returned air mixing as well as changes in air temperature of the bypass damper and the placement position directly affect the homogeneity of returned air mixture as well as the dimension of the bypass damper of the VAV fan-coil unit and its placement position value require further study. During the simulation analysis, including three different sizes of bypass damper and different placement position: placement position of the bypass damper. According to the simulation results, utilizing the bypass damper not only can improve air mix, but it can also raise the air temperature through the degree of damper opening, so that the VAV fan-coil unit characteristic as evidence by the reduced temperature differential of the returned air.

When the indoor cooling load is stable, the system will adjust the fan-coil unit to maintain minimum amount of air indoor air circulation at the lowest standard, and is expected to resolve the dumping phenomenon produced by the loading situation, as well as achieving the purpose of energy saving and comfort of the VAV fan-coil unit.

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