Split-type air-conditioner heat dissipation

The use of split-type air-conditioners has been growing in residential buildings of Hong Kong. In new apartment buildings, the building re-entrants are popular for placing the outdoor condensing units. Nevertheless, the effect of heat dissipation from all condensing units at a re-entrant can be detrimental. Improper condenser layout incurs energy wastage, equipment de-rating and malfunction problems. Because of the continuing changes in (i) outdoor air conditions, (ii) the individual air-conditioner usage, and (iii) the room loading, accurate prediction of the thermal impact at a re-entrant is highly difficult. Based on the Computational Fluid Dynamics analysis incorporating with an energy performance evaluation model, the effectiveness of various condenser layout schemes in building re-entrants was evaluated. The evaluation was extended to seek the alternative way of placing the condensing units in an air-conditioning plant room provided in individual domestic flat. The similar approach was used for predicting the condensing unit performance at the low-rise residences.

Array of condensing units at a building re-entrant.

Air temperature contours at one floor level of an L-shape re-entrant for different wind conditions
Alternative schemes of introducing condenser cooling airflow via light wells

Related publications:

Chow TT, Lin Z. Thermal problems of split-Type air-conditioning units installed at high-rise buildings of Hong Kong. Proceedings of ACHRBB '97, IIR International Symposium, Shanghai, China, September 1997, pp.108-113
Chow TT, Lin Z, Wang QW, Lu JWZ. Studying thermal performance of split-type


