

Case story

Monumental energy savings in cooling system

Consplant Tower, Malaysia

In modern, commercial buildings different uses are often combined to provide a bustling and attractive business environment. Office spaces are primarily used during daytime, shopping malls into the early evenings and restaurants into the night. The mixed

use of the buildings, however, may challenge the energy efficiency of the cooling system. A high level of cooling is typically required during the day in most parts of the buildings, whereas only limited space needs cooling at night.

A photograph of the Consplant Tower, a modern glass skyscraper. The building's facade is composed of large glass panels reflecting the sky and surrounding environment. In the foreground, there is a covered entrance area with a canopy. To the right, a sign on the building reads "WISMA CONSPLANT 2". A red callout box is overlaid on the left side of the image, containing the text "67% of energy savings achieved by perfect hydronic balancing of the cooling system at Consplant Tower.".
67%**of energy savings**

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Advantages of the heating/cooling solution:

- Energy savings of 67 %
- Pay-back time of only two years
- Increased comfort at all times
- Optimized pump and chiller efficiency
- Increased lifetime of all system components

That was precisely the challenge presented at the Consplant Tower, a 20-storey building on the outskirts of Kuala Lumpur in Malaysia. How to reduce the energy costs for cooling during night time while still offering a nice, cool environment to the guests at the tower's restaurant?

The Pressure Independent Balancing and Control Valves (PIBCV) presented an excellent and cost efficient solution for the Consplant Tower.

"The Danfoss PIBC valves (AB-QM) have proven to be an energy efficient and cost saving product according to the calculations performed by ACR Engineering and Danfoss. With the new valves the air conditioning system has become much simpler, and we can save time by avoiding tedious balancing procedures and reduce the manpower used for this. I can certainly recommend the valves to be used on all future projects, for example Wisma Consplant 1 and other future projects, says Ir Mohd Azharibin Che Omar, Mechanical Director at YHS Associates SDN BHD in Kuala Lumpur, Malaysia.

Energy savings of 67 % with new cooling solution

The challenge of variable cooling at the Consplant Tower was solved by the hydronic balancing specialists of Danfoss by the use of the advanced Danfoss Hydronic Analyzer. The tool is used to analyse the efficiency of heating and cooling systems and to determine the energy saving potential.

"The analysis resulted in several changes to the cooling system. First of all the system was equipped with 200 pressure independent AB-QM valves to ensure steady and reliable cooling at all times depending on the actual cooling demands. Furthermore, the cooling solution has been changed from a constant air volume to a variable air volume so that the flow of air can automatically be adjusted to the use of the building at different times", explains Derek Foong, Business Development Manager at Danfoss in Malaysia.

The critical pressure point of the system was accurately determined by the hydronic calculations so that the pumps could be set to operate with maximum efficiency. The energy savings achieved by the new solution



amounts to 67 % during off-peak times, i.e. at night when only the restaurant needs cooling.

High indoor comfort and stable temperature levels

The PIBC valves ensure a constant high level of comfort for the users of the building.

"When you set the thermostat, the temperature will be stable due to the automatic balancing system. Even with varying outside temperatures and varying cooling demands, the accurate hydronic balancing will ensure a proper flow providing the desired level of cooling in every part of the building", says Derek Foong.

The AB-QM valves are easy to install and commission. The valves are maintenance-free as they contain no movable parts. Furthermore, the design of the valves prevents clogging during everyday use.

About the Consplant Tower:

- 230,000 sqf, two blocks, 14 floors each, mostly used for offices, ground-floor restaurant
- The building was originally constructed in 1992
- The renovation of the cooling system was completed in 2012

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