



REFERENCE >

Pressurisation & Water Quality > Balancing & Control > Thermostatic Control

ENGINEERING ADVANTAGE



Expertise ensures
optimal indoor comfort
at university campus



FACTS

Project Type:	University building renovation
Location:	Hong Kong, China
Gross Area:	9,840 m ²
Test Area:	700 m ²
Owner:	Hong Kong Polytechnic University
Payback Time:	14 months (test area)
Products:	
Balancing and Control:	STAD, STAF and STAP

When Hong Kong Polytechnic University planned to renovate their old HVAC system, the challenge proposed by the Hong Kong government was to ensure that indoor temperature in air-conditioned buildings should be kept above 25.5°C to reduce environmental impact.

As such, they set out to find a partner with the know-how and capability to enable precise temperature control with optimised efficiency. In turn, TA Hydronics proved to be the partner with the perfect solution.

Hong Kong Polytechnic University has an extensive campus with almost 30,000 students and approximately 1000 staff. The first phase of this HVAC system renovation project covers an area of nearly 10,000 m².

The challenge

The university's system had to be optimised to maintain a healthy and comfortable indoor climate with precise temperature control and a high level of efficiency. To begin, a complete system review and renovation of a representative 700 m² test area was planned. This would demand both expertise and a close working relationship between the university and TA Hydronics.

The Solution

The key was to establish a reliable hydronic balance. In an unbalanced system, the terminals closest to the pump operate in overflow while those further away are in underflow. This is a typical issue in HVAC systems and results in varying indoor climates in different rooms. People then attempt to compensate for this discomfort by adjusting thermostat settings, which reduces efficiency and can compromise comfort.

The first step in reaching the optimal solution was to review the existing system. TA Hydronics began with a thorough analysis, measuring differential pressure, flow and temperature inside the chilled water system. TA Hydronics' own software, TA Select, was then used in the design phase for hydronic calculation and component selection.

The next step towards increased comfort was the installation of selected system components, mainly balancing valves together with differential pressure controllers. Commissioning support was provided, making sure that the solution would deliver from the outset and provide optimum comfort, energy savings and the fine degree of temperature control the university required. Owing to the specialist knowledge of TA Hydronics, the TA CBI balancing instrument was used to help speed up commissioning and made the process more precise and more cost-efficient.

To verify the performance of the upgraded system, a test was carried out in a representative part of the system to measure both cooling performance and energy consumption.

The outcome

By comparing both the old and renovated systems it became clear that the new system was able to deliver a superior level of comfort and increased energy-efficiency. As a result of the newly commissioned solution, the water flow remains stable, minimising temperature fluctuation and enables an excellent level of control. As such, the university expects a full payback on its initial investment in just 14 months.



"TA Hydronics' innovative differential pressure control valves are now being used following the re-commissioning of this installation to regulate the pressure and flow of the hydronic systems. In the experimental phase, significant energy savings were achieved in the buildings of the Polytechnic that utilise this self-regulating climate control technology"

Professor Daniel W. T. Chan of the university's Dept. of Building Services Engineering.

As a result of the successful outcome, Hong Kong Polytechnic University will continue to optimise its campus HVAC systems in the coming years. The university aims to have a fully controllable indoor climate, optimising both energy efficiency and indoor comfort. In turn, the university trusts TA Hydronics' specialist knowledge and expertise.