

## Case study

# Small Valves Introduce **Big Changes to Building Efficiency** and Occupant Comfort

In the six years since it welcomed its first tenant, The Park business center in Chodov, a suburb of Prague in the Czech Republic, has become a magnet for hi-tech companies looking to establish offices in eastern Europe. The center's strategic location in the heart of the European Union, with access to transportation and a highly educated workforce, makes The Park attractive to IBM, Dell, Sony, Sun Microsystems, Accenture Services, DHL and other international tenants.

Just as tempting to potential tenants are the state-of-the-art technologies that fill each of the 11 buildings that comprise the campus. Among them is a sophisticated building management system that controls and monitors mechanical and electrical systems, a high-speed fiber optic ring, cutting-edge fire and safety systems, and advanced heating and cooling systems that heat and cool 1,080,000 square feet of office space. Center owner AIG/Lincoln regularly assesses these systems,

making adjustments where necessary and introducing new technology when available, always with an eye to improving building performance and creating high-quality, cost effective solutions for its clients.

The incorporation of Danfoss AB-QM valves in the center's heating and cooling system represents just such an introduction of new technology that is having a positive impact on building performance. AB-QM valves were introduced in the seventh building constructed at The Park, the result of a recommendation by Scheu +Wirth Praha, mechanical contractor for the project.

"In the first six buildings, a three-way valve system required the entire heating, ventilation and air-conditioning (HVAC) system to operate at maximum flow," explained JürgenWinkler, of Scheu +Wirth Praha.



As a result, the HVAC systems used more energy than necessary, and pumps were required to work longer and harder, further increasing energy usage at The Park.

“By introducing the AB-QM valves,” Winkler continued, “we were able to limit flow and, in the process, offer AIG/Lincoln increased system efficiency, improved flexibility and significant energy savings.”

The AB-QM pressure independent balancing and control valve (PIBCV) provides a flow limiter and a control valve in one compact package. This means the valve can be used as a stand-alone, automatic flow limiter valve or as a combined flow limiter and control valve when fitted with a wide range of actuators, providing accurate and stable flow in all cooling and heating applications.



According to Winkler, the AB-QM valve introduced a number of benefits, beginning with ease of installation. The valve eliminates the need to install numerous control elements. As a result, installations of large HVAC systems with AB-QM valves can be accomplished in steps without requiring adjustment to already running parts. And, once a system or part is completed, it is ready for operation. The correct flow can be adjusted in one simple step, without the use of tools.

“Building designers appreciate the simplicity of our solutions, while contractors are happy to eliminate installations of numerous controlling/adjusting elements in the whole system,” said Michal Kucera, Danfoss key account manager. “All that needs to be installed is a cooling system without any interim elements, plus terminal cooling units with our valves and a driving system.”

The valves make it easy to make changes in the system, during either the design or installation stage or during operation. “In addition, adjusting the AB-QM control valves to optimum values is as simple as adjusting your watch,” said Kucera. The valve’s authority no longer needs to be calculated because the AB-QM features a unique design that ensures 100 percent authority with all settings and differential pressures. This increases quality and precision, leading to increased comfort in the building.

“The automatic maximum flow limitation makes it possible to respond promptly and easily to changes in outside temperature or changes required by our tenants,” said Ales Knotek, AIG/Lincoln property manager. “And we can do that without making the extensive calculations and adjustments that were required in the past. The valve introduces an important element of flexibility that enables us to more closely meet the needs of individual tenants.”

Additionally, more comfortable tenants mean fewer complaints and less servicing of the system.

Just as significant are the energy savings attributable to the valves. According to Kucera, when compared to systems with three-way valves and a constant flow, variable flow systems that use AB-QM valves are more economical, providing exactly the correct amount of heating/cooling water to a terminal unit at any given moment. Savings are generated because circulation pumps work less and the operation is continuously optimized, in both low-load and maximum load situations.

Because AB-QM valves were not used in The Park’s first six buildings, owners were able to compare operating efficiencies between comparably sized and occupied buildings with AB-QM technology and without. Records indicate that during summer months, when the demand on the HVAC system was highest, buildings featuring AB-QM valve technology consumed, on average, 38 percent less electricity than buildings with standard valves.

"In fact, the savings increased to as much as 52 percent during the month of May, when consumption was 21,569 kWh for a building without the AB-QM technology compared to 10,424 kWh for a building with the valves," said Knotek.

Savings like these made the decision to install AB-QM valves in all new buildings at The Park an easy one for AIG/Lincoln. To date, approximately 1,000 of the valves have been installed in six buildings, and an additional 300 have been ordered for the 12th building that is currently under construction.

"In addition, based on the positive results at The Park, we selected the valves for inclusion in another project outside of Prague – Campus Square," said Knotek. Located in nearby Brno, this 215,000-square-foot retail center includes more than 50 shops, a gourmet food court and a hypermarket, and is an important part of The Campus project, which includes an office and research and development complex. Here, as in The Park, the AB-QM valve is ensuring the efficient operation of the HVAC system by limiting flow and acting as a control valve.

The Park comprises Class A office space and a variety of landscape gardens and community spaces that provide 7,000 people with places to relax and meet with colleagues. Outside, trees, plants and fountains work together to create a comfortable environment. Inside, a carefully designed HVAC system that incorporates AB-QM valves does the same thing, responding to the changing needs of building occupants precisely and promptly, without sacrificing energy efficiency in the process. What's more, The Park supports AIG/Lincoln's long-term business objectives of creating high-quality, cost-effective and timely financial and real estate solutions for its clients.