PICCV Adds Longterm Value to High Rise Property in Mid-Town Atlanta

Roger Bennett was looking for an opportunity to showcase pressure independent control valve technology to his clients. He found it when his firm, WayPoint Systems, was awarded the contract to provide a complete Direct Digital Control (DDC) system retrofit for a high rise property in midtown Atlanta, known as 1100 Peachtree. The 582,000 square-foot, 28-story class-A office building is managed by Carter and Associates.

At the time the decision to retrofit the existing automation system was made, over 60% of the centrally located high rise was tenant occupied. Carter decided to upgrade both the HVAC and lighting controls with an Alerton DDC system with web interface. The owner desired a system that would provide better overall efficiency and operability than the existing pneumatic control system. Installations would have to be staged, and relatively seamless, since the existing tenants would continue to occupy the building during renovations.

Roger Bennett strongly advocated the use of Belimo electronic Pressure Independent Characterized Control Valves (PICCVs) installed throughout the building for (air handling units, fan coil units, VAV reheats). There are a number of reasons why he believed electronic valves and actuators would serve the long term purposes of this property, which are summarized below.

Better Overall Temperature Control

According to Bennett, building occupants are becoming less and less tolerant of temperature drifts in workplace environments. Pneumatic airflow systems typically lose accuracy at 25% of their span, resulting in the capability of only a 4:1 turndown ratio.[1] Therefore it becomes difficult to deliver accurate flow through the valve at low loads—so temperature swings occur and occupant comfort suffers.

The PICCV maintains constant flow through the terminal unit while dynamically balancing the supply based on demand. Since the valve combines the functions of an automatic balancing valve and control valve, it is impervious to changes in pressure; it nullifies the effect of changes in differential pressure on the valve. Therefore, proper flow rate is accurately and automatically controlled—even during low load periods. Other valves may "hunt" during light loads, the PICCV maintains an equal percentage response to changes in demand, delivering a linear heat (or cooling) output.

Eliminates Maintenance

Unlike the PICCV, pneumatically controlled valves are controlled by devices that require a lot of maintenance and re-calibration. Furthermore, if they drift significantly out of calibration, no one is likely to know unless someone complains. Belimo PICCVs are factory programmed for exact performance, do not require recalibration or re-balancing, and are controlled by an accurate, repeatable electronic signal. Furthermore, performance of the PICCV can be verified at any time via the Alerton Energy Management System, which has web interface.

This will be advantageous to 1100 Peachtree not only in terms of routine maintenance, but because it eliminates the need for rebalancing due to load changes. Load increases will invariably occur when the 7 unoccupied floors are filled with tenants.

Increased Energy Efficiency

Variable flow systems are becoming the industry standard in commercial hydronic systems because of increasing concern over energy cost. Pressure independent valve technology allows owners to capitalize on the energy savings afforded by these systems. The PICCV assures that each terminal obtains just the required flow, which reduces pumping costs and chillers run much more efficiently. This is in contrast to what operation would have been like had the owner opted to stay with straight pneumatic control.

"To get pressure dependent valves with pneumatic actuation to work on the higher floors of a high rise building, the system has to operate with a very high differential pressure, so pumps have to work extra hard to get flow to the top

1. http://ateam.lbl.gov/Design-Guide/DGHtm/ddcvs.conventionalpneumaticcontrols.htm

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floors. Meanwhile, coils on the lower floors can get too much water. This leads to improper heat gain and overly cold return water temperatures to the chiller plant," explained Bennett.

PICCV technology helps eliminate these problems (typically known as low ΔT), which can reduce the comfort and efficiency of both heating and cooling systems.

Savings Ahead

"We fully expect to see the efficiency of the building to improve and electric bills to decrease," said Bennett, who plans an extensive comparative study of system operation after it has gone through an entire cooling season.

In the meantime, Bennett has a high end property with which he can showcase the technology of the PICCV to other building management companies and owners like Carter, who demand performance and energy efficiency in their property investments. Although the PICCV can cost more than a standard valve assembly, the installed cost is virtually the same since it eliminates the cost of balancing labor and materials. Furthermore, the energy cost savings typically yield a 2 year payback or less, which speaks volumes to today's building owners who are much more energy savvy.

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