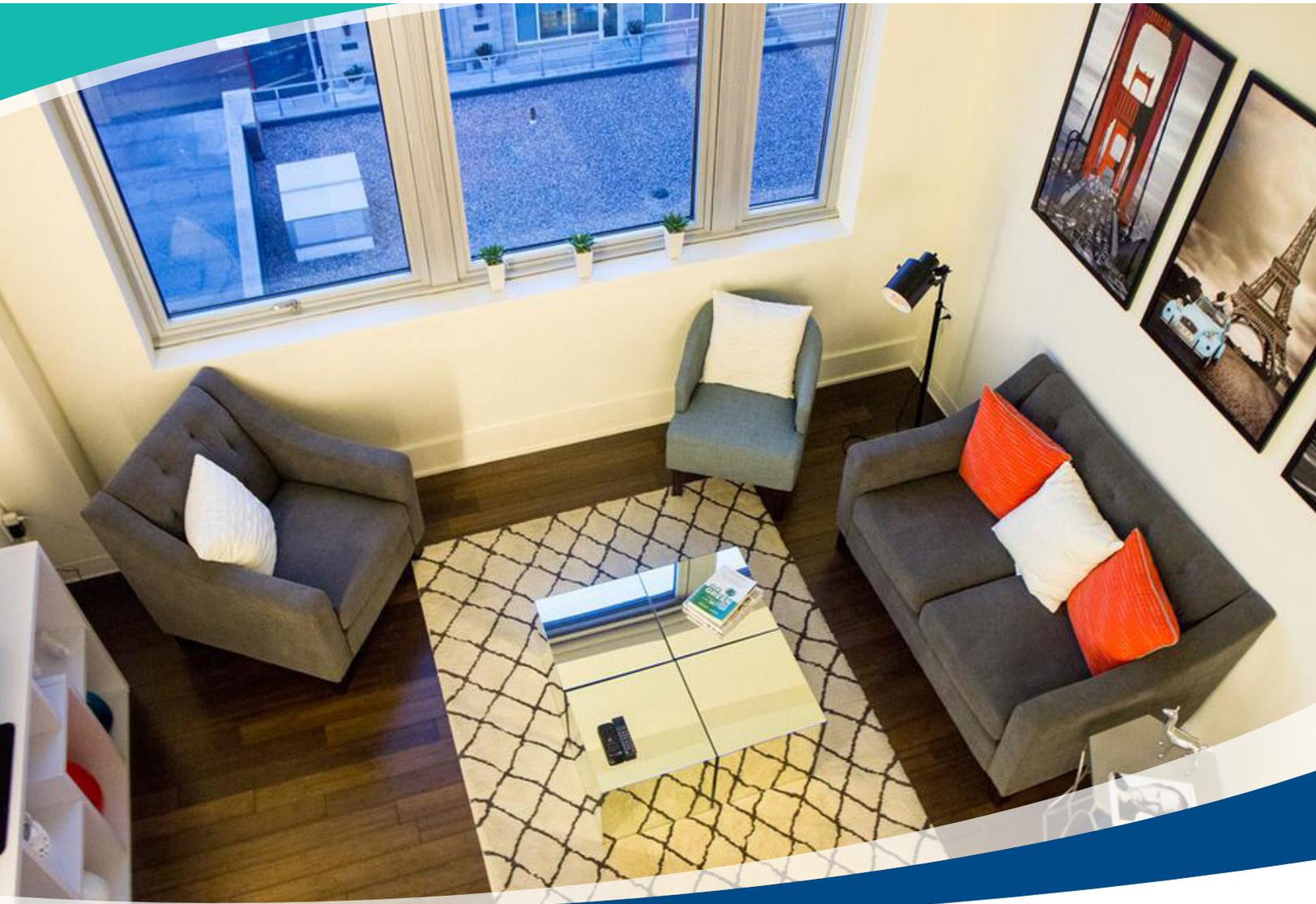


Retro Style and High Efficiency HVAC

Blended Seamlessly at The LUX



How does a mid-century downtown office building in Wichita, Kansas, transition into a LEED-worthy apartment building and commercial space while still maintaining its cool 1950's vibe?

That was the challenge facing developers of The LUX, a multi-unit residential property and commercial space, reincarnated from what was once the Kansas Gas & Electric Building. The vision was clear – repurpose this downtown architectural icon into a mixed-use property that would attract commercial tenants to its lower levels, while also luring residential dwellers eager to experience the thrill downtown living in a luxury apartment brimming with 1950’s character. Meanwhile, stay on-point with today’s more environmentally conscious consumers by reinventing the property in a way that meets LEED Gold certification standards.

As always, the devil is in the details – details like increased ventilation without the energy penalty, not to mention ducting supply air to 85 apartment units in a building that was originally set up as office space. These and other challenges forced a decision between adapting existing chilled water equipment (saving on first cost) or starting fresh with a more flexible, higher efficiency approach.

Paul Black, Executive Vice President of Professional Mechanical Contractors (PMC) in Wichita, believed that a new system based on variable refrigerant volume (VRV) technology would provide his client with greater long-term efficiency and reliability. Combined with de-centralized energy recovery ventilation from Systemair, this was the solution that he advocated to developer Michael Ramsey.

“We were originally investing a more traditional [central chilled water] system. However, Paul understood our desire for LEED certification and said, ‘Hey - we’ve got this new technology and we’d like you to look at it.’”

Black explained to Ramsey how VRV systems differ from conventional HVAC systems in that they vary and distribute refrigerant rather than water or steam to multiple zones. As a result, VRV systems are extraordinarily efficient and flexible. And because they are almost entirely ductless they are very adaptable to existing structures where space may be lacking, especially older buildings that are being renovated.

Topvex ERV – An Efficient Fresh Air Solution

VRV systems offer tremendous flexibility and long-term value, however one thing they do not offer is a means for ventilation because they do not incorporate a central air handler like traditional chilled water systems. For ventilation of all the commercial spaces and common areas at The LUX, Black recommended Systemair Topvex Energy Recovery Units (ERVs).

Topvex ERVs are ideally suited for VRV applications and can be designed to work in concert with a VRV system, or operate independently. At The LUX, the six vertical Topvex units located on the first and second floor of the building are ducted directly to the VRV units serving those floors. Fresh outdoor air passes through the ERVs where it is pre-conditioned with return air, and then enters the VRV units where it may be heated or cooled further depending on whether the space temperature is satisfactory. This significantly reduces the heating and cooling load on the VRV system.



Topvex TR Series

Topvex ERVs are extraordinarily efficient at part-load conditions thanks to electronically commutated motors (EC-motors). EC-motors are designed to operate at high efficiency even during low RPM periods and consume an average of 30% less energy than AC motors. The whisper-quiet motors are standard on all Topvex units so no separate variable frequency drives (VFDs) are required, which reduces wiring at the jobsite.

Lighter Equipment, Better Technology

Opting for the VRV system and separate ventilation strategy actually ended up costing less to install because it reduced or eliminated the need for other materials and equipment. Less insulation and ductwork was required, and the need for variable air volume (VAV) boxes and chilled water pumps and piping were completely eliminated.

“If we had gone with a conventional system we would have also had to bring in two large air handlers to the first and second floor. That would have been really tricky,” said Black. “Refrigerant piping makes for a much ‘lighter’ system than conventional chilled water.

We believed it was better for the client to invest in technology and long-term efficiency rather than all that hardware. So this solution actually cost less, plus The LUX was able to start out with all new equipment, avoiding future costs.”

Kevin Zimmerman of PKMR Engineers, the firm responsible for the mechanical design at The LUX, agrees that VRV and Topvex technologies were an excellent solution for the retrofit. He is also confident that the ERV/VRV combination will go a long way in helping his client achieve points for energy efficiency as part of LEED Gold certification.

“The Topvex ERV definitely goes hand-in-hand with VRV systems. The fact that it is so compact makes it especially applicable in a retrofit situation like The LUX,” said Zimmerman, who has since specified the Topvex on other projects. “The ERVs will also help reduce the high humidity levels that are typical in Wichita – and help increase humidity in the winter.”

Commercial tenants are already enjoying the benefits of better indoor air quality and lower utility rates. Defense Audit and Defense Contract Management agencies were among the first to occupy the commercial lease spaces at The LUX. Residential tenants were closing on leases before the project was even complete. So, the future looks bright for this downtown retrofit. It is, indeed, a shining example of how modern technology and historically significant architecture can combine to create sought-after work and living spaces.

