HVAC Technology Advancements: DOAS and VRF

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Commercial buildings require outside air ventilation to meet indoor air quality requirements. Ventilation air can be provided with conventional HVAC units with both a return and outside air intake, or with a separate Dedicated Outdoor Air System (DOAS) ventilation HVAC unit. A DOAS unit must be able to handle the extreme temperatures and relative humidity ratios of ventilation air to provide neutral air to the space, or to the units that are conditioning the space of the building.

"Energy efficient and easy to design, install, and maintain, a VRF system has low life cycle cost"

A DOAS actually consists of two systems. One system conditions the air in the space to control the indoor air conditions and maintain occupants' comfort. The other system conditions 100% outdoor air, which is then supplied to the space. This DOAS unit must be able to control the temperature and humidity of ventilation air at nearly any condition throughout the year. A DOAS allows easy measurement of the outdoor ventilation air supplied to

the space.

AAON DOAS units are available with a variety of options to address temperature and humidity control concerns. Options include variable capacity compressors, energy recovery wheels, modulating gas heating, high-capacity coils, and modulating hot gas reheat. Variable capacity scroll compressors modulate cooling capacity from 10 to 100% to tightly control the supply air temperature. With longer run times than on/off compressors, they also dehumidify the air significantly better. Energy recovery wheels reclaim exhaust air energy to pre-cool, pre-heat, dehumidify, and humidify the ventilation outside air. This reduces the load on the refrigeration system and heating system of the unit. Modulating gas heating allows tight control of the supply air during the heating season. High-capacity coils handle low airflows of DOAS units and provide more dehumidification (latent capacity) than a standard coil. Modulating hot gas reheat is available to provide precise humidity control for consistent occupant comfort without temperature swings common to on/off reheat systems.

AAON DOAS equipment is built with premium performance in mind and configurable for nearly any application. AAON rooftop units are constructed with double-wall rigid polyurethane foam cabinets, and available with corrosion-resistant exterior and interior paint for unit durability. Foam panel construction saves energy by reducing heat transfer through the cabinet and reducing air leakage through the cabinet. A stainless steel drain pan and optional polymer e-coating coils offer increased corrosion resistance while also improving air quality.

AAON DOAS units are manufactured with maintenance in the forefront of the design; every AAON unit features elements that

make it one of the easiest to service in the industry. Run test report, wiring diagrams, and an Operation and Maintenance Manual with startup form are provided in the control access compartment of every unit. Color-coded wiring diagrams allow fast connection identification and analysis and thus a reduction in down time and cost. Individual components and wires are also labeled for quick circuit evaluation.

AAON DOAS Rooftop units come with access doors with full-length stainless steel piano hinges, and quarter-turn, lockable handles provide improved reliability over single point hinges and make the unit easily serviceable. AAON DOAS Rooftop unit compressors and unit controls are contained within a compartment isolated from the air stream for ease of service and increased sound dampening. Readily accessible compressors and control components allow timely evaluation of service issues without delay. The result of this AAON standard procedure is low service cost and greater unit run time.

DOAS systems must be designed to handle extreme conditions. AAON DOAS equipment is designed from concept to completion for durability, easy maintenance, high efficiency, and premium performance. (Source: www.aaon.com)

WHAT VRF CAN DO FOR YOU

Building owners and managers can be very demanding when it comes to choosing the right HVAC equipment for their buildings. Not only do they need the equipment to keep their tenants (and possibly themselves) warm and comfortable throughout the winter, and cool and contented during the summer, they also want their HVAC system to be energy-efficient, reliable and of course, cost-effective.

For this reason, Variable Refrigerant Flow (VRF) technology continues to grow in popularity for many facilities as a single outdoor unit can serve a number of indoor units. VRF is a superior way to heat and cool any space, providing improved humidity control, individual set points per indoor unit, and a very quiet comfort experience. Energy efficient and easy to design, install, and maintain, a VRF system has low life cycle cost compared to other systems on the market today. According to a 2016 JP Morgan study, the report concluded that the reductions in the structural, mechanical, and electrical costs of installing a VRF system offset the higher cost of the mechanical system itself, making the all-in first cost of VRF comparable to other HVAC solutions.

This technology is a great option for building owners, managers and homeowners who are looking to minimize operational costs while simultaneously increasing occupant comfort. With the ability to do simultaneous heating and cooling

through a heat recovery, not only do occupants get to personalize their comfort, but they do so within a single system, eliminating the need for a separate heat source, reducing the impact to the outdoor environment and contributing to lower operational costs. Whether a commercial, light-commercial or residential application, VRF technology offers some of the lowest lifecycle costs for an HVAC system.

Providing exceptional comfort, efficiency and reliability, VRF solutions from industry leaders such as LG Electronics offer cost effectiveness and easier installation, making this technology among the most versatile and powerful system available today. In addition to being energy efficient, building owners will appreciate the design flexibility of VRF technology, as systems can be configured to be ducted, duct-free, or a hybrid of the two, allowing builders to choose the system that best fits their needs. This flexibility allows VRF solutions to be installed in almost any application, including projects where traditional systems are not feasible. One new VRF system that is continuing to gain industry acclaim for commercial, light-commercial and residential spaces, is the award-winning LG Multi V™ series. Featuring the best-in-class inverter compressors, the Multi V series offers superior performance, efficiency and some of the lowest lifecycle costs in the industry.

To find out if VRF is the right solution for your building project, visit LGHVAC.com.