

HVAC HANDOUT

A Proven Approach to High-Performance HVAC Improves Efficiency, Health and Comfort



The next step in the evolution of HVAC.

The very high efficiency dedicated outside air system (very high efficiency DOAS) approach pairs the highest performance HVAC equipment with key design principles to provide cleaner and safer indoor air, enhance indoor comfort and reduce commercial building HVAC energy use. This approach has been demonstrated to reduce HVAC energy use by an average of 69% when compared to a code-minimum version of the existing equipment (often a packaged rooftop unit).¹

High-efficiency equipment meets thoughtful HVAC design.

Very high efficiency DOAS is proven to deliver a variety of benefits to building owners, operators, designers and occupants alike, including:

- Significantly reduces energy costs and lowers overall building energy use by an average of 48% and HVAC energy use by an average of 69%.¹
- Improves indoor air quality and reduces viral risk by using fresh and filtered air with little-to-no circulation – all while using up to 37% less energy than a similar high-ventilation variable air volume (VAV) system.²
- Allows for the downsizing of heating and cooling equipment to reduce maintenance costs and the lifetime cost of the system.
- Increases occupant comfort by improving temperature stability and allowing for zones with unique temperature controls.
- Offers design flexibility with several manufacturers offering a variety of readily available qualifying heat/energy recovery ventilators (HRVs/ERVs).
- Meets or exceeds the 2018 Washington State Energy Code requirements for new construction or major HVAC system replacements, which requires DOAS in many applications.

THE FOUR KEY ELEMENTS OF VERY HIGH EFFICIENCY DOAS

- 1/ High-performance electric heat pump system
- 2/ High efficiency heat or energy recovery ventilator (HRV/ERV) with $\geq 82\%$ sensible effectiveness
- 3/ Right-sized heating and cooling equipment
- 4/ Fully decoupled ventilation from heating and cooling



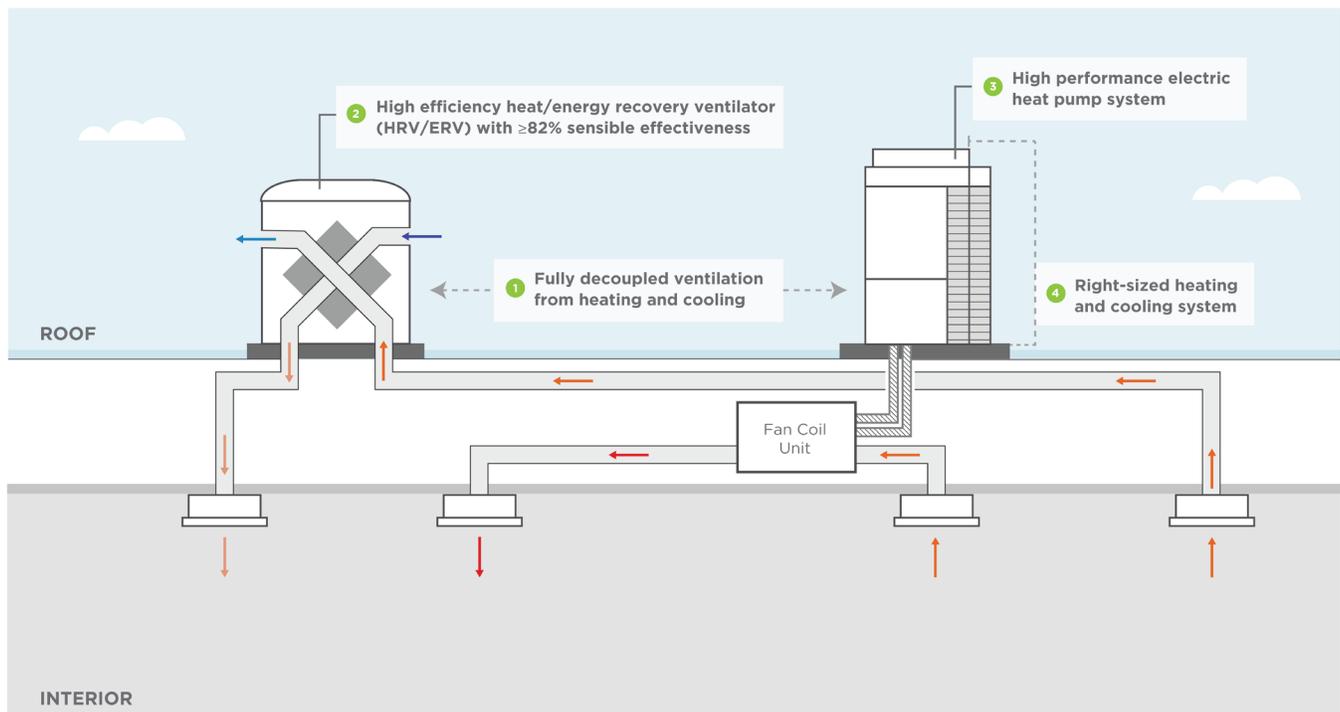
How very high efficiency DOAS works.

Very high efficiency DOAS combines high-performance HVAC equipment with the dedicated outside air system (DOAS) approach that separates heating and cooling from the ventilation system. This design approach minimizes energy by combining a high-efficiency HRV/ERV (82% or greater sensible effectiveness) with a high-efficiency, ENERGY STAR®-rated heating and cooling system. And with many available system options on the market, the very high efficiency DOAS approach offers built-in flexibility at the HVAC design phase.

The decoupling of ventilation air from primary heating and cooling allows for optimal and efficient control of each critical building function while circulating 100%

fresh and filtered outdoor air throughout the building, with little-to-no recirculation. The very high efficiency DOAS approach further maximizes performance by allowing building designers to right-size their heating and cooling equipment and ductwork. This right-sizing increases system performance, saves space on the roof and offers building designers enhanced design flexibility.

Northwest-based installations have revealed some ideal project and buildings types that can benefit from this approach, including small-to-medium-sized buildings (less than 50,000 sq. ft.), both new construction and major renovations, and several buildings types, including schools, retail, government and office buildings.



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¹ When compared to a code-minimum version of the existing equipment (often a packaged rooftop unit); Data based on 12 demonstration projects in small-to-medium commercial buildings throughout the Northwest.

² Study performed by the Northwest Energy Efficiency Alliance (NEEA), Red Car Analytics and the University of Oregon. Learn more at betterbricks.com/resources/covid-19-hvac-riskreduction-strategies.

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