Air-Source Heat Pumps

RN Series
RQ Series
H3/V3/M2 Series
CF Series

AAON®

AAON

Building decarbonization, the reduction of carbon dioxide through the use of low-carbon power sources, is now a crucial design standard. Many are shifting to fossil fuel-free solutions — with HVAC equipment playing a pivotal role.

AAON Alpha Class. Redefining excellence

AAON Alpha Class is our highest-performing solution ever and is the industry's most versatile line of commercial air-source heat pumps.

AAON Alpha Class air-source heat pumps provide optimal heating and cooling functions and are often used as a more energy-efficient and environmentally friendly alternative to traditional heating and cooling systems. With industry-leading quality, you can expect superior energy savings, accessible maintenance, and reliability. AAON offers a wide range of Alpha Class air-source heat pumps from 2 to 70 tons in packaged rooftops and split systems.

Engineered for reliable, comfortable performance

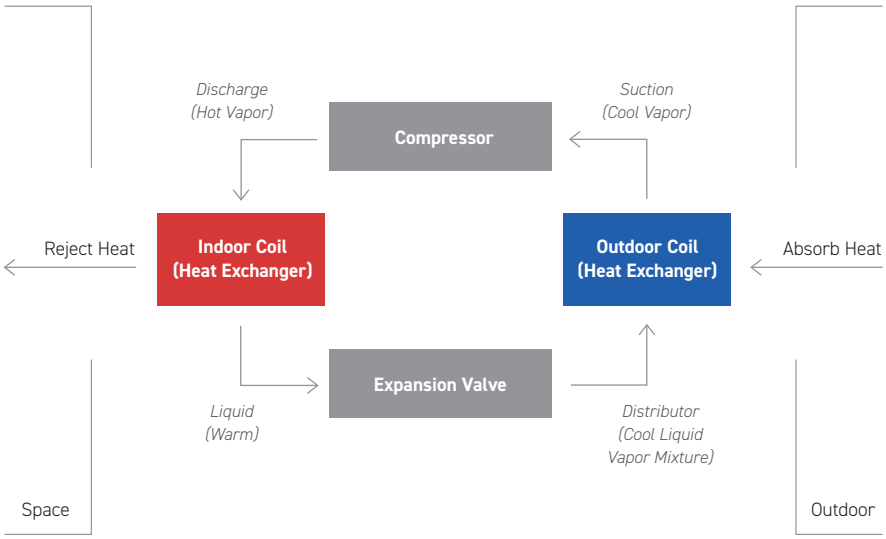
AAON Alpha Class air-source heat pumps provide precise comfort control without relying on fossil fuels.

When a space requires cooling, the heat exchanger located in the indoor air stream has cold refrigerant flowing through it — enabling it to absorb heat from the air as it passes over it, providing cool, comfortable air for occupants. The heat absorbed by the refrigerant is then transferred via the DX cycle and expelled through the heat exchanger located outdoors. This process removes the heat from the space and rejects it into the atmosphere.

When a space requires heating, the heat exchangers switch roles by reversing the refrigerant flow direction. The refrigerant entering the coil in the space air stream is now hot and rejects its heat to the cool space providing warm, comfortable air for occupants. The outdoor heat exchanger now acts to absorb heat from the outside air, therefore serving as the heat source.

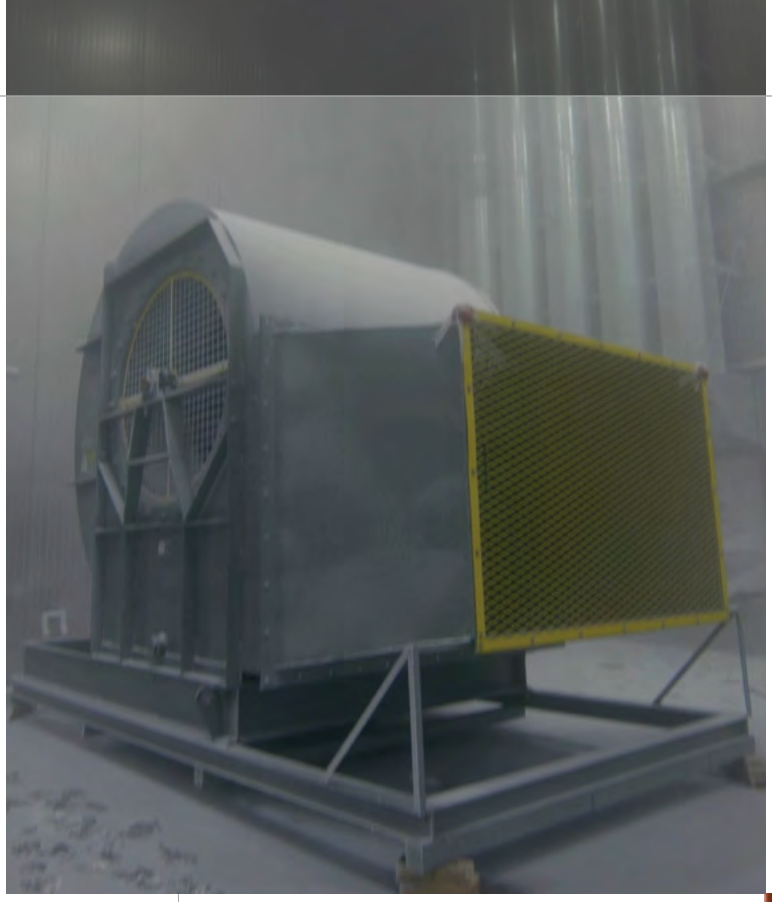
HP DX Heating Cycle

In an air-source heat pump, air is the medium to which heat is absorbed or rejected via the heat exchangers.



A growing market

As more states, cities, and companies advocate for electric-only heating and cooling, air-source heat pumps are gaining popularity. The rising cost of traditional heating energy sources like oil and gas makes energy-efficient air-source heat pumps more appealing and cost-effective. Government policies, financial incentives, tax credits, and rebates further boost the affordability and adoption of air-source heat pumps. This convergence of environmental benefits, long-term cost savings, and governmental support drives the growing need for air-source heat pumps.



Low-ambient challenges

The effectiveness of traditional air-source heat pumps can diminish in colder regions, as they depend on transferring heat from the outdoor air rather than employing combustion for heating. AAON Alpha Class air-source heat pumps include configurable options that allow them to effectively operate in low-ambient temperatures.

Variable speed compressors and variable speed fans, combined with AAON Controls, allow reliable heat pump heating performance even on extreme off-design days down to 0°F.

AHRI provides heat pump testing standards for operation down to 17°F. AAON products undergo rigorous testing in our cutting-edge NAIC laboratory. While AHRI does not provide a standard that accounts for heat pump performance at extremely low temperatures, the NAIC allowed us to test and prove performance of the AAON Alpha Class variable speed compressor air-source heat pump down to 0°F.

Omni-climate — optimized for any environment.

Where air-source heat pumps were once unsuitable for certain climate regions, the technology has evolved to perform in diverse climates from the mountains of Colorado to the beaches of Florida. Enjoy the energy savings of air-source heat pump technology while positively impacting the environment, regardless of your location.

AAON air-source heat pump advantages

High efficiency

DURABLE CONSTRUCTION

AAON air-source heat pumps are built with durable polyurethane foam-injected panels, which add rigidity, limit the heat transfer into or out of the cabinet, and prevent conditioned air leakage. Foam-injected panel construction is a great way to increase the efficiency of the unit and save energy. During low-ambient conditions, it is crucial to retain as much heat supplied to the space as possible.

VARIABLE SPEED FANS

Variable speed supply fans and variable speed outdoor fans provide high-performance heat pump heating and cooling airflow. Variable speed control allows for energy savings at reduced airflow. Variable speed condenser fans control the head pressure over the complete range of temperatures experienced by the unit.

WIDE COMPRESSOR OPTIONS

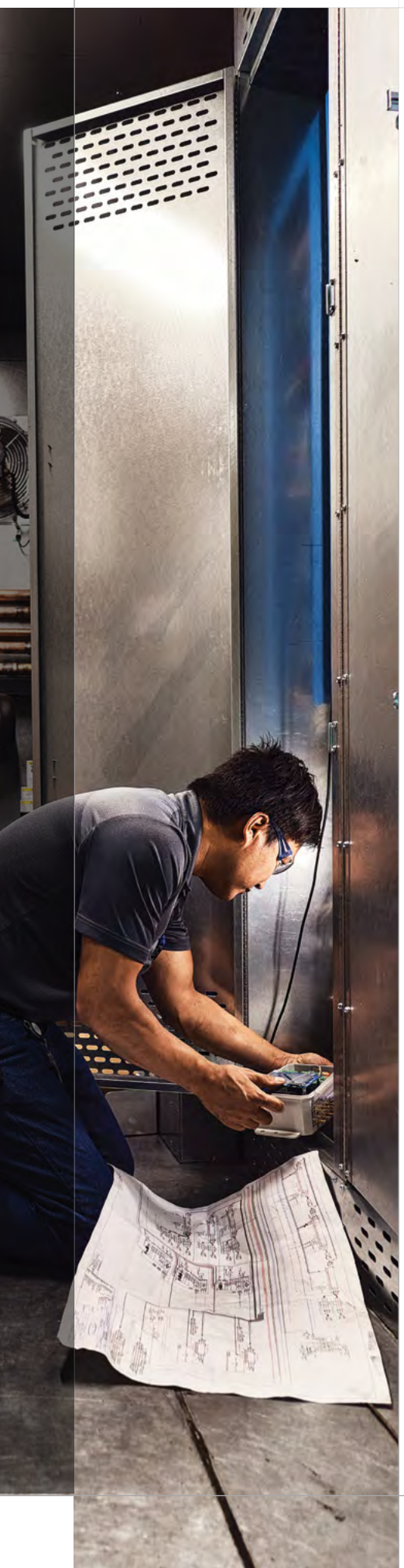
Variable speed compressors offer the ultimate heat pump performance, with the highest part load efficiencies, precise temperature and humidity control, and refrigeration safety measures.

For simple control, variable capacity and two-step compressors are available. Two-step compressors allow for simple staged control. Variable capacity compressors allow for a wide range of capacity control (10%–100%) for improved part load efficiency with the use of basic DDC controls.

ECONOMIZER OPTION

Up to 100% outdoor airflow economizer dampers provide energy-saving, free conditioning when conditions meet setpoint values. This feature also provides ventilation air under all conditions to meet the indoor air quality requirements of commercial buildings.

The thermal range for the image captured here is -4°F to 62°F.



Flexibility

FACTORY-INSTALLED ENERGY RECOVERY WHEELS

AAONAIRE® energy recovery wheel is capable of transferring sensible and latent energy from the incoming air stream to the exhaust and preconditioning the supply air. This saves energy by reducing mechanical heating and cooling use and can also lower costs by increasing effective system capacity by 30% or more by allowing smaller equipment to be selected.

HIGH-EFFICIENCY FILTRATION

ASHRAE recommends using a minimum of MERV 13 filters to trap viruses more effectively. Standard backward curved plenum supply fans can handle the additional static pressure associated with the higher-quality filtration. This option is available on all AAON Alpha Class air-source heat pumps.

FRESH AIR VENTILATION

Bringing fresh outside air into a building helps flush out infectious aerosols and reduces CO_2 levels in the space. AAON Alpha Class units have makeup air capability and can be specified with up to 100% outside air. AAON uses AMCA-certified low leakage dampers, ensuring optimal fresh air supply only when needed. A DOAS unit will typically require the use of an energy recovery wheel to control the mixed-air conditions, and may require additional auxiliary heating capacity.

DUAL FUEL

In addition to the 100% electric configuration, AAON offers supplemental gas heat for applications that require it. Gas heat is only used in extremely low-ambient temperatures, greatly reducing overall fossil fuel usage while providing comfort in all conditions. This configuration can also help reduce electrical requirements.

MODULATING HOT GAS REHEAT

For precision humidity control, AAON offers modulating hot gas reheat to deliver maximum occupant comfort. This is especially important in DOAS applications.

AUXILIARY HEAT

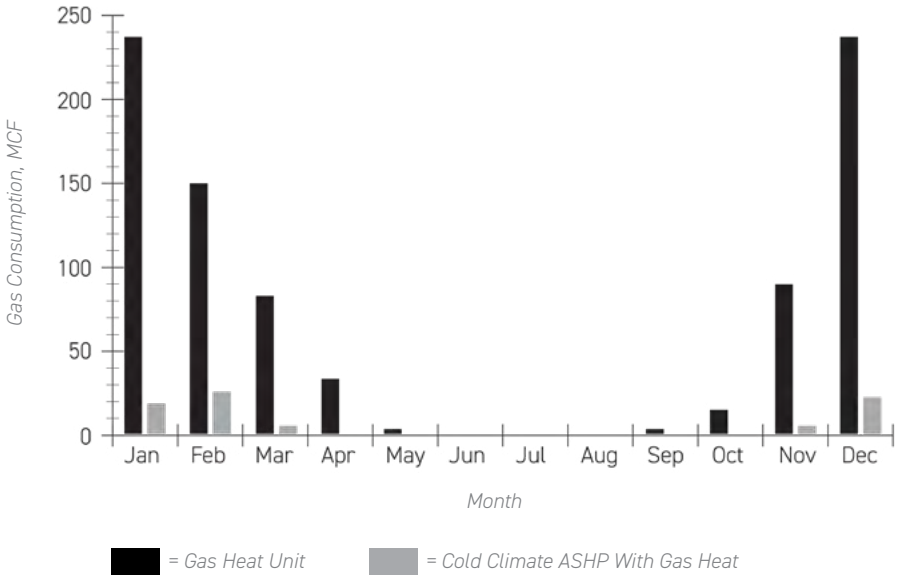
AAON offers auxiliary electric heat to supplement air-source heat pump heating. While AAON's advanced air-source heat pumps with variable speed compressors excel in colder conditions, the inclusion of auxiliary electric heat is strongly advised. It serves as a crucial safety backup and ensures optimum comfort during defrost operations.

DEFROST OPTIMIZATION

Elevating performance to a new level, AAON's defrost control sequences minimizes cycle duration. When defrost is in progress, our units seamlessly transition to cooling mode, swiftly warming the coils beyond the defrost threshold. Complemented by supplemental heat sources, they maintain your indoor comfort with unmatched precision and efficiency.

MONTHLY GAS CONSUMPTION (MCF)

Gas Consumption Chicago, IL Gas Heat Unit vs Cold Climate Air-Source Heat Pump Unit.



ANNUAL GAS CONSUMPTION (MCF)

	Gas Heat Unit	Cold Climate ASHP Unit	% Gas Reduction
Chicago, IL	739	60	91.9%
New York, NY	532	14	97.4%
Seattle, WA	409	2	99.5%
Nashville, TN	343	11	96.8%
Denver, CO	530	75	85.8%
Toronto, ON	963	100	89.6%
Minneapolis, MN	1200	294	75.5%
Dallas, TX	143	1	99.3%

Serviceability

HINGED ACCESS DOORS

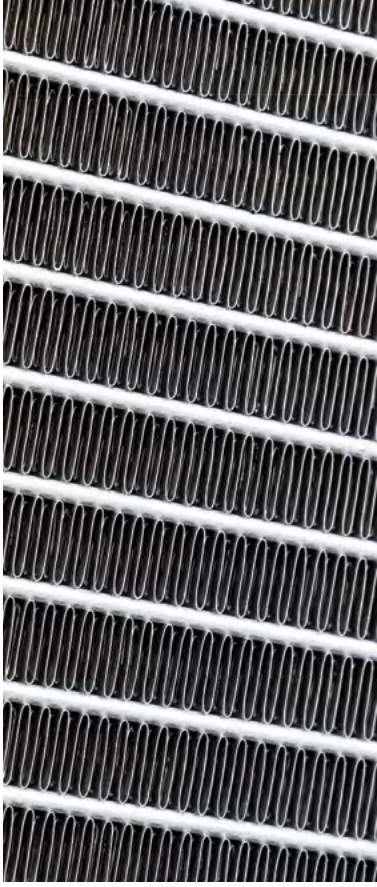
Access doors with full-height stainless steel piano hinges and lockable handles provide superior access and serviceability for the isolated compressor and controls compartment. Access to the unit interior for maintenance is made easy with standard hinged doors that open against pressure.

CONTROLS AND COMPRESSORS COMPARTMENT

Unit controls and compressors are contained within a compartment isolated from the air stream for ease of service and quiet operation.

COLOR-CODED WIRING

Color-coded wiring diagrams allow fast connection identification and analysis and thus a reduction in downtime and cost. Individual components and wires are also labeled for quick circuit evaluation. The result of this AAON standard procedure is low service cost and greater unit run time.



Dedicated outdoor air systems (DOAS)

In a cooling mode, an air-source heat pump configured as a DOAS excels at regulating indoor humidity and introducing fresh air. However, when transitioning to heating mode, a DOAS unit may encounter difficulties in colder conditions, often as high as 25°F.

To address this challenge, the utilization of an energy recovery wheel helps balance the indoor and outdoor load, enabling the DOAS unit to maintain effective operation even in lower temperatures. This becomes especially vital as DOAS units typically operate with 100% outside air, making it challenging to maintain indoor comfort and meet temperature requirements when the temperature drops to freezing levels. Additional auxiliary heating capacity may also be required, depending on application conditions.

Air-Source Heat Pumps

RN SERIES
6-70 tons

RQ SERIES
2-6 tons

SPLIT SYSTEMS
H3/V3/M2 and CF Series
2-60 tons

CF Series condensing units can be matched with M2, H3, or V3 indoor air handling units as an air-source heat pump.

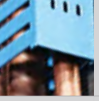
For a better tomorrow

The path to a sustainable and energy-efficient future is clearer than ever before. Embracing decarbonization with air-source heat pumps not only results in reduced carbon footprints but also secures long-term energy savings.

AAON Alpha Class air-source heat pumps are designed to deliver not only immediate benefits but also long-term savings on your energy costs. With features like high-efficiency filtration, dedicated outdoor air system capability, and even auxiliary gas heat options for extreme conditions, we ensure that your comfort and efficiency are the top priority. Crafted with serviceability in mind, they provide a reliable and efficient heating and cooling solution that doesn't compromise on comfort.

As you embark on the journey of exploring the possibilities of an air-source heat pump, remember that you're not just making a smart choice for performance and efficiency. You are, indeed, making a significant contribution to a greener planet. Join us in building a sustainable future, one where the comfort of today doesn't come at the expense of the world of tomorrow.

Work with your local AAON representation to find an AAON Alpha Class solution that is optimized for your specific application.



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Rev. 240719