RN/RQ Series

PACKAGED ROOFTOP UNITS, AIR-SOURCE HEAT PUMPS, WATER-SOURCE/ GEOTHERMAL HEAT PUMPS, & OUTDOOR AIR HANDLING UNITS

RQ Series

RN Series

Features:

- Air-cooled or water-cooled condenser, with unit capacities from 2-140 tons
- Available as a chilled water or non-compressorized DX air handling unit, from 800-49,100 cfm
- Air-source, water-source, and geothermal heat pump options
- R-410A scroll compressors - one, two, three, or four compressor systems
- Variable capacity and variable speed scroll compressors for load matching cooling and improved part load efficiency
- Electric, gas, steam, or hot water heating
- AMCA certified and labeled low leakage economizer dampers
- Direct drive backward curved plenum fans
- Power exhaust and power return options
- Factory installed AAONAIRE® total and sensible energy recovery wheels
- Double wall rigid polyurethane foam panel construction with a minimum R-value of 13
- Service access doors with full length stainless steel piano hinges and lockable handles
- Double sloped stainless steel drain pans

Application Flexibility
Minimizes Installation Time and Reduces Cost

- *Makeup Air Applications Up to 100% Outside Air*
- *Dehumidification and Filtration Capabilities*
- *Large Tonnage Rooftops with Small Footprints*
- *Factory Installed or Customer Specific Controls Options*

RN/RQ Series
Rooftop/Air Handlers

AAON RN and RQ Series rooftop units continue to lead the packaged rooftop equipment industry in performance and serviceability. Double wall rigid polyurethane foam insulated cabinet construction and direct drive backward curved plenum fans allow RN and RQ Series units to have quiet, energy efficient airflow with high static pressure capabilities. RN and RQ Series units also feature lockable hinged doors which provide service access to all sections of the unit.

Superior Features

- Cabinet construction consists of rigid polyurethane foam panels with G90 galvanized steel on both sides and a closed cell polyurethane foam interior core. The inner wall protects the insulation from moisture damage, prevents microbial growth, and is easy to clean.
- Two inch rigid polyurethane foam insulated panels have a thermal resistance R-value of 13 or greater, which exceeds the R-value of a cabinet with four inch thick fiberglass construction. They also make the cabinet more rigid and resistant to damage and reduce radiated sound.
- 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.
- Corrosion resistant polyurethane paint exceeds a 2,500 hour salt spray test.
- AMCA Certified low leakage gear driven economizer dampers are standard on RN and RQ Series rooftop units. AAON low leakage dampers meet the California Title 24 damper air leakage requirement. Optional Economizer Fault Detection and Diagnostics is also available with the low leakage dampers to meet the California Title 24 requirements.
- Compressors and unit controls are contained within a compartment isolated from the air stream for ease of service and reduced radiated sound.
- Direct drive backward curved plenum fans provide improved energy efficiency and reduced maintenance versus belt driven fans.
- Double sloped stainless steel drain pans eliminate standing water which can support microbial growth and stainless steel construction prevents corrosion that could lead to water leaks and contaminants in the air stream.
- Run test report, wiring diagram, and Installation, Operation, and Maintenance manual with startup form provided in control access compartment of every unit.
- 5 year non-prorated compressor warranty, 15 year non-prorated aluminized steel gas heat exchanger warranty, and 25 year non-prorated stainless steel gas heat exchanger warranty.

AAON equipment is service friendly with color coded wiring diagrams, heavy duty access doors and handles, and easy access to components.

Quality Construction

▲ Cutaway of double wall rigid polyurethane foam insulated cabinet panel increases thermal resistance, reduces air leakage, and attenuates radiated sound. Thermal break reduces heat transfer between interior and exterior metal cabinet walls.

R-13 Double Wall Rigid Polyurethane Foam Panel Construction

AAON is setting a new standard for performance with double wall construction using closed cell polyurethane foam insulation. Not only does it have several times the insulating R-value, it creates a far more rigid and stronger assembly with less air leakage than fiberglass insulated panels.

▶ Standard AMCA Certified AAON Low Leakage Damper

AMCA Certified and Labeled Low Leakage Dampers

Gear driven economizer eliminates the excess play and bind that occurs with linkage type economizers. Standard AMCA Certified and Labeled AAON Low Leakage Dampers meet the California Title 24 damper air leakage requirement.

◀ Microchannel condenser coils are durable, more efficient, lighter, and use less refrigerant than traditional fin and tube condenser coils. These coils are standard on all air-cooled condenser RN/RQ Series rooftop units. The Modulating Hot Gas Reheat option includes microchannel reheat coils.

Direct Drive Backward Curved Plenum Fans are more energy efficient, quieter, and require less maintenance than belt driven fans. VFD controlled and ECM driven supply, exhaust, and return fans are available for precise air flow control, building pressure control, and reduced power consumption. ▶

Rooftop Units (2-6 tons)

RQ Model	Cabinet	Air-Cooled SEER	Air-Cooled EER	Nominal cfm	Width*	Height*	Length*
RQ-002	Vertical or Horizontal	Up to 20.3	Up to 14.8	850	44	51	82
RQ-003				1,050			
RQ-004				1,400			
RQ-005				1,750			
RQ-006				1,800			

*Dimensions vary depending on options selected. • All dimensions are in inches • Design cfm may be 30-50% greater or less than nominal cfm.

▶ 2-6 ton RQ Series Air-Cooled Condenser Rooftop Unit

AHRI Certified High Efficiency

The RN Series is available with an IEER rating up to 22.5, while the RQ Series is available with a SEER rating up to 20.3.

▲ 11, 13, & 16-30 ton RN Series Horizontal Configuration Unit with Factory Provided Final Filtration

Horizontal Configuration

Horizontal configuration is available for RQ Series units (2-6 tons) and RN Series units (11, 13, 16-30 tons). This configuration provides a solution for applications that require horizontal ductwork; it does not require special horizontal supply/return curbs. All of the premier features and options currently available for the RQ and RN units are available with this configuration. **High efficiency final filtration configuration is available on the RN Series units for health care and other applications that require it.**

Rooftop Units (6-30 tons)

RN Model	Cabinet	Configuration	Air-Cooled IEER	Air-Cooled EER	Nominal cfm	Width*	Height*	Length*
RN-006	A	Vertical	Up to 22.5	Up to 14.0	2,000	79	44	82
RN-007					2,500			
RN-008					2,650			
RN-010					3,000			
RN-009	B		Up to 20.4	Up to 14.9	3,400	96	50	88
RN-011					3,600			
RN-013					3,800			
RN-015					4,200			
RN-014	C		Up to 22.5	Up to 13.7	5,200	101	60	110
RN-016					6,400			
RN-018					6,800			
RN-020					7,000			
RN-025					9,000			
RN-030					10,500			
RNA-011	C	Horizontal	Up to 22.5	Up to 13.7	3,600	101	60	138
RNA-013					3,800			
RNA-016					6,400			
RNA-018					6,800			
RNA-020					7,000			
RNA-025					9,000			
RNA-030					10,500			

*Dimensions vary depending on options selected. • All dimensions are in inches • Design cfm may be 30-50% greater or less than nominal cfm.

6-30 ton RN Series Air-Cooled Condenser Packaged Rooftop Unit

Rooftop Units (26-70 tons)

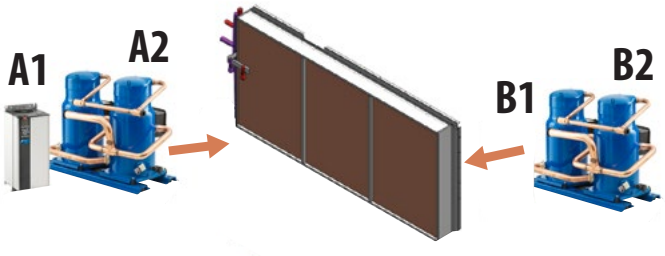
RN Model	Cabinet	Configuration	Air-Cooled IEER	Air-Cooled EER	Nominal cfm	Width*	Height*	Length*
RN-026	D	Vertical	Up to 20.0	Up to 11.9	10,000	100	102	161
RN-031					12,400			
RN-040					16,000			
RN-050					20,000			
RN-060					23,000			
RN-070					25,000			

*Dimensions vary depending on options selected. • All dimensions are in inches • Design cfm may be 30-50% greater or less than nominal cfm.

26-70 ton RN Series Packaged Rooftop Unit

AAON continues to improve packaged rooftop equipment with design updates to the RN Series D Cabinet:

- Two refrigerant circuits for significant gains in efficiency (IEER / EER)
- Interlaced evaporator coil for superior turndown and consistent face temperature
- Staged, Variable Capacity, or Variable Speed Compressor options
- Microchannel lag circuit reheat coil



A two circuit system allows for excellent turndown and better part load efficiencies than four circuits. In variable speed and variable capacity compressor units, the first circuit is variable capacity and feeds the entire face of the evaporator coil for even cooling of the supply air. The second circuit compressors are also interlaced and provide additional capacity when needed. First and second circuit may include individual or tandem compressors, depending on the unit size.

Rooftop Units (55-140 tons)

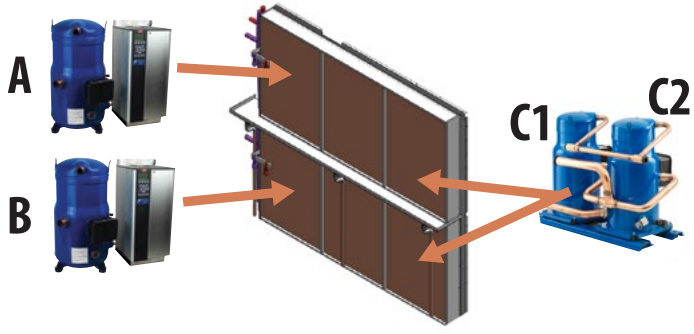
RN Model	Cabinet	Configuration	Air-Cooled IEER	Air-Cooled EER	Nominal cfm	Width*	Height*	Length*
RN-055	E	Vertical	Up to 18.3	Up to 11.3	15,000	142	105	230
RN-065					17,000			
RN-075					18,000			
RN-090					22,000			
RN-105					24,000			
RN-120					29,500			
RN-130					32,000			
RN-140					33,000			

*Dimensions vary depending on options selected. • All dimensions are in inches • Design cfm may be 30-50% greater or less than nominal cfm.

▸ 55-140 ton RN Series Packaged Rootop Unit

The RN Series E Cabinet includes the following design enhancements:

- Variable speed compressors for better part load efficiency
- Interlaced evaporators for superior turndown and consistent face temperature
- Improved airflow through the condenser for better efficiency
- Microchannel lag circuit reheat coil



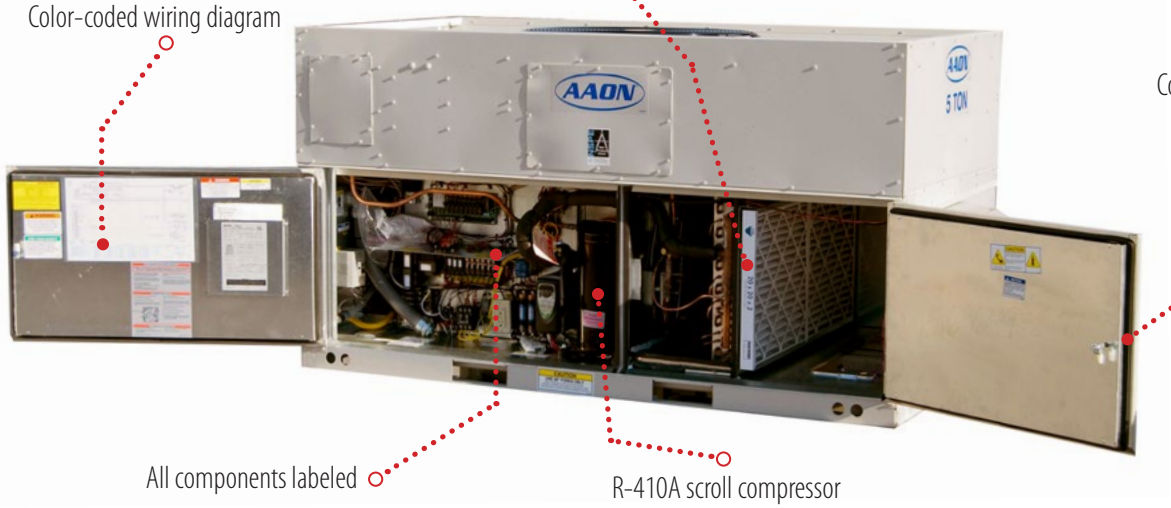
Variable Speed Compressors A and B modulate together for superior turndown and consistent face temperature. The tandem compressors provide additional capacity while the variable speed compressors maintain control of the supply air temperature.

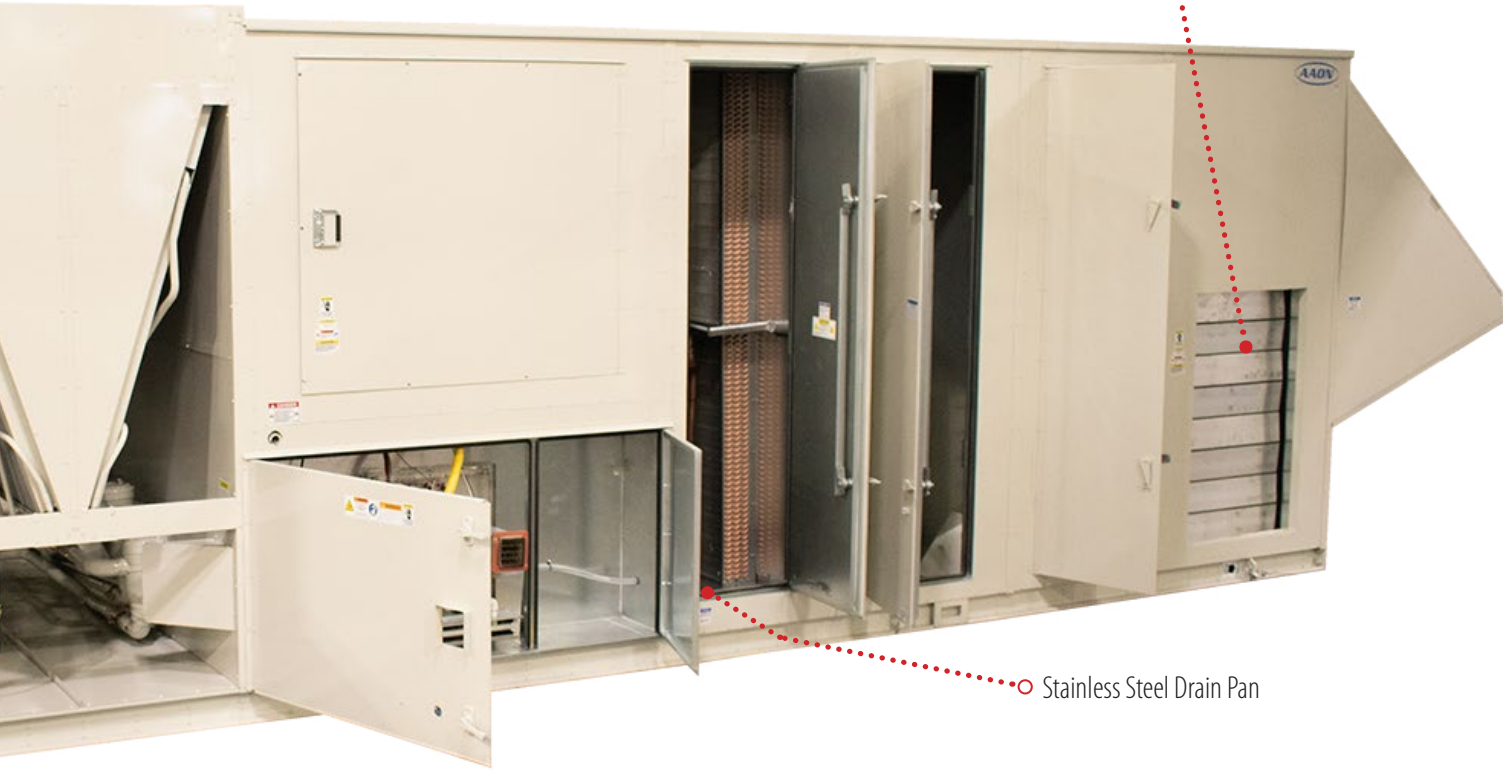
Ease of Service

Ease of Service

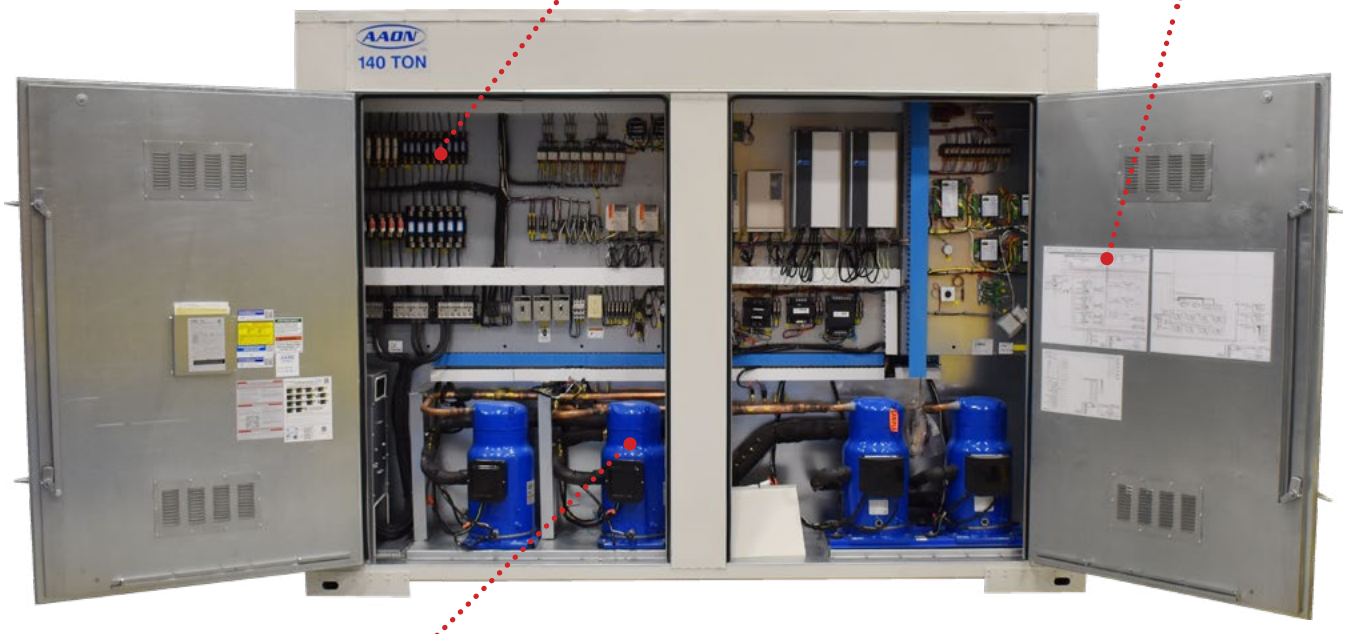
AAON equipment is designed from concept to completion with minimum service time as a primary factor. Readily accessible compressors and control components allow timely evaluation of service issues without delay. Color-coded wiring diagrams allow fast connection identification and analysis and thus a reduction in down time and cost. Individual components and wires are also labeled for quick circuit evaluation. The result of this AAON standard procedure is low service cost and greater unit run time.

2-6 ton RQ Series





55-140 ton RN Series



Feature Flexibility

Premier Options

- Variable capacity and variable speed R-410A scroll compressors for load matching cooling and improved part load efficiency.
- Variable speed air-source heat pump for high efficiency non-fossil fuel heating down to 0°F ambient.
- Water-source and geothermal heat pump options for energy efficient heating.
- Factory installed total or sensible AAONAIRE energy recovery wheels.
- Humidity control options including: High Capacity Coils, Modulating Hot Gas Reheat Humidity Control, and Return Air Bypass.
- Chilled water cooling coils allow unit to tie into new or existing chilled water system.
- Hot water or steam heating coils allow unit to tie into new or existing boiler system.
- Polymer e-coated coils are available to extend the life of the coils and protect them in corrosive environments.
- Power exhaust and power return fans with economizer for application flexibility.
- VFD controlled and ECM driven supply, exhaust, and return fans for precise airflow control, building pressure control, and reduced power consumption.
- Modulating gas heat with stainless steel heat exchanger provides greater fuel efficiency, longer heater life, and improved occupancy comfort.
- SCR (Silicon Controlled Rectifier) electric heat control for reduced power consumption, longer heater life, and improved occupant comfort.
- Multiple high efficiency air filtration options.
- Unit controls options including factory installed customer provided controls.
- VFD controlled or ECM driven condenser fans for energy savings and refrigerant head pressure control.

▲ Dimpled heat exchanger provides energy efficient heat transfer and has no internal turbulator, which can corrode over time.

▲ Customers can select AAON controls or factory installed customer provided controls

▶ Up to MERV14 filters

Indoor Air Quality

The quality of air inside a building impacts the health and cognition of those inside. AAON rooftop equipment standard design and options can help to improve indoor air quality.

Cabinet Construction

AAON rooftop equipment is constructed of double wall rigid polyurethane foam injected panels. The interior cabinet is a smooth metal wall as opposed to fiberglass insulation that can hold bacteria and mold.

Double wall polyurethane foam injected panels with metal interior liner

Outdoor Air Ventilation

Bringing fresh outside air into a building helps flush out infectious aerosols and reduces CO_2 levels in the space. AAON RN and RQ Series units have makeup air capability and can be specified with up to 100% outside air. AAONAIRE energy recovery wheels are available on makeup air units to increase the unit's energy efficiency. High capacity cooling coils are available to handle the higher latent load of outside air. Modulating gas heat and SCR electric heat are available to provide energy efficient supply air temperature heating. AAON can precisely control humidity of a space using modulating hot gas reheat. Research has shown that some viruses are rendered inactive on surfaces when the ambient relative humidity was between 40%-60%.

AAON Economizer can provide up to 100% outside air

Filtration

ASHRAE recommends using a minimum of MERV 13 filter to more effectively trap viruses. This option is available on all sizes of rooftop equipment and the standard backward curved supply fans are capable of handling the additional static pressure associated with the higher quality filtration.

UV lights

UV lights can be used to inactivate pathogens in the airstream of an air handling unit.

UV Light options are available factory installed for both keeping the cooling coil clean and for single pass air disinfection

Energy Saving Configurations

2-6 ton RQ Series with Cross-Flow Fixed Plate Heat Exchanger Energy Recovery

Electric Preheat is available with all AAON energy recovery options for frost prevention.

Cross-Flow Fixed Plate Heat Exchanger Energy Recovery

Cross-flow fixed plate heat exchangers save heating and cooling dollars by pre-cooling, pre-heating, and humidifying the ventilation outside air (depending on ambient conditions). Cross-flow fixed plate heat exchangers have no moving parts and can also improve indoor air quality by eliminating cross contamination. Sensible only or enthalpy fixed plate heat exchangers are available to meet application requirements. Fixed plate heat exchangers are available in the RQ Series (2-6 tons).

Outside Air Bypass allows for higher ventilation airflow and full economizer operation. Damper can also be used for defrosting the heat exchanger.

Factory installed AAONAIRE energy recovery wheel saves heating and cooling energy. Slide-out wheel allows for quick and easy maintenance.

AAONAIRE® Energy Recovery Wheel

The energy recovery wheel option can be provided in all model sizes allowing reduced equipment size and operating cost savings while pre-conditioning the outside air being introduced into the conditioned space. Sensible only or enthalpy wheels are available to meet the humidity control requirement of the system. Segmented polymer wheels allow for easy cleaning. Aluminum wheels are also available for application that require aluminum construction. Bypass dampers can be selected for full economizer operation.

Aluminum Energy Recovery Wheel

AHRI CERTIFIED®

AHRI Certified Performance

All AAON energy recovery options feature AHRI Certified heat exchangers.

Precision Comfort Control

Compressor Capacity Control

RN and RQ Series units have a variety of compressor options available for load matching cooling, providing both high full load and part load efficiency. Options include staged, two-step, 10-100% variable capacity, and variable speed compressors. Two-stage compressors provide a cost effective additional cooling capacity stage that improves part load efficiency. Units with 10-100% variable capacity scroll compressors are simple to control and the compressors have a wide range of capacity modulation. Variable speed compressors use compressor motor speed control to reduce capacity, save energy, and reduce sound.

◀ VFD controlled variable speed scroll compressors provide load matching cooling and improve part load efficiency.

▶ Variable capacity compressors allow for a wide range of capacity control (10-100%) for improved part load efficiency with simple controls.

◀ Two-Step Scroll Compressors provide the simplicity of staged capacity control with high part load efficiency

Two-Step Compressors improve part load efficiency with simple staged control. Unit IEER can be optimized without requiring complex refrigeration and DDC controls, reducing operating costs and maintenance costs. Two-step compressors are available in the RQ and RN Series.

Variable Speed Compressors

Variable speed compressors provide load matching cooling and the highest efficiency ratings when operating at part load conditions. Refrigeration controls are built-in to the AAON equipment to protect the compressors and optimize the efficiency for VAV, Single Zone VAV and Makeup Air applications. Variable speed compressors are quiet in operation, especially at reduced capacity. Heat pump units with variable speed compressors can provide high efficiency non-fossil fuel heating down to 0°F ambient.

▲ 2-6 ton RQ Series with inverter driven variable speed compressors for load matching cooling and improved part load efficiency

Heat Pump Options

Water-Source Heat Pump Performance

Rooftop Model (MBH)	Airflow (cfm)	Fluid Flow (cfm)	Water Loop		Ground Water		Ground Loop	
			Cooling EWT 86°F Heating EWT 68°F		Cooling EWT 59°F Heating EWT 50°F		Cooling EWT 77°F Heating EWT 32°F	
			EER	COP	EER	COP	EER	COP
RQ-002	800	5.8	Up to 14.70	Up to 5.10	Up to 23.50	Up to 4.60	Up to 16.80	Up to 3.60
RQ-003	1,200	9.4						
RQ-004	1,600	11.8						
RQ-005	2,000	14.5						
RQ-006	2,400	16.7						
RN-006	2,400	14.0	Up to 14.50	Up to 5.30	Up to 22.20	Up to 4.50	Up to 16.70	Up to 3.60
RN-007	2,800	17.8						
RN-008	3,200	20.7						
RN-010	4,000	26.3						
RN-009	3,600	24.2	Up to 16.40	Up to 6.00	Up to 25.00	Up to 5.00	Up to 19.10	Up to 3.90
RN-011	4,400	29.2						
RN-013	4,800	32.0						
RN-015	5,100	35.0						

Ratings at AHRI Conditions as in accordance with ISO Standard 13256-1

Heat Pump Option

Energy efficient cooling and heating can be achieved by reversing the flow of the unit's refrigeration circuits. This allows the indoor coil to be used as either a cooling coil or heating coil depending on the outdoor conditions. This is a more efficient method of heating than electric heating because a heat pump can reject more heat to the space per the amount of energy used. Thus, the operating costs of heat pump heating are always less than the operating costs of electric heating. Heat pumps do not require the use of fossil fuels, and depending on local energy costs, may be save operating costs compared with a gas heating system. AAON provides three different options for heat pump; geothermal, water-source, or air-source.

Geothermal Heat Pump Option

Geothermal heat pumps take advantage of the relatively constant temperature of the earth below ground level to transfer heat to or from the building via water flowing through a loop of underground pipes. Depending on latitude, ground temperatures range from 45°F to 75°F. This ground temperature is warmer than the air above it during the winter and cooler than the air in the summer. Ground water heat pumps use a body of water for this heat exchange.

Water-Source Heat Pump Option

Water-source heat pumps work in a similar way as geothermal heat pumps except using a cooling tower and boiler system. A typical WSHP application is a multistory building or large campus.

Air-Source Heat Pump Option

Air-source heat pumps use the outdoor air as the heat transfer medium. This system provides the heat pump efficiency benefits and does not require a water loop.

Air-Source Heat Pump Performance

Rooftop Model	Airflow (cfm)	SEER/IEER	EER	H1 COP	H1 Capacity (BTU)	HSPF
RQ-002	900	Up to 20.2	Up to 14.2	Up to 3.6	24,000	Up to 10.1
RQ-003	1,300				36,000	
RQ-004	1,650				45,500	
RQ-005	1,750				58,000	
RQ-006	2,100				63,000	

Application Flexibility

RN Series Water-Source/Geothermal Heat Pump Packaged Rooftop Unit

AHRI CERTIFIED® www.ahridirectory.org
Water Source HP
ANSI/AHRI/ASHRAE/ISO13256

Makeup Air Capability

AAON RN and RQ Series units have makeup air capability and can be specified with up to 100% outside air. AAONAIRE energy recovery wheels are available on makeup air units to increase the unit's energy efficiency. High capacity cooling coils are available to handle the higher latent load of outside air. Modulating gas heat and SCR electric heat are available to provide energy efficient supply air temperature heating. Modulating humidity control is available to provide dehumidification without over cooling when the outside air humidity is above setpoint. Variable capacity scroll compressors are available to provide energy efficient supply air temperature control.

Dehumidification

AAON offers many humidity control options. High capacity cooling coils are available which allow for more dehumidification versus standard cooling coils. Return air bypass is available on RN Series units for single coil humidity control. Modulating hot has reheat humidity control is available to provide energy efficient dehumidification, even with low sensible heat loads, without the temperature swings common with on/off reheat systems.

Single Zone VAV

Single zone VAV systems modulate the supply fan speed based on the space temperature and modulate the variable capacity or variable speed compressor based on the supply air temperature to provide variable airflow at a constant supply air temperature to control the space temperature of a single zone. For part load conditions, the single zone VAV unit will operate at a lower fan speed for a greater amount of time, saving valuable energy and providing the space with more constant temperature and humidity control.

Air Handling Unit Option

AAON RN and RQ Series outdoor air handling units provide a hydronic cooling and heating option. Gas, electric, steam, and hot water heating are available on an RN and RQ Series air handling units. Cabinet construction is similar to the packaged rooftop units with easily accessible coil connections.

High and Low Ambient Operation

With robust design and construction, AAON equipment can be rated and operate up to 125°F (52°C) ambient and down to 0°F (-18°C).

AAON Environmentally Friendly HVAC Product Family

Outdoor Air Handling Units
(800 - 72,000 + cfm)


RQ Series


RN Series


RZ Series, Pinnacle

Condensing Units
(2-70 tons)


CB Series


CF Series

Chillers
(4-55 tons)


LF Series

Self-Contained Units
(3-70 tons)


SB Series


SA Series


M2 Series

Indoor Air Handling Units
(800 - 50,000 + cfm)


F1 Series


H3 Series


V3 Series


SA Series


M2 Series

Water-Source Heat Pumps
(½ - 230 tons)


WH Series & WV Series, ProFit & EcoFit


RQ Series


RN Series


SA Series


SB Series


RZ Series, Pinnacle


M2 Series

Packaged Rooftop Units
(2-240 tons)


RQ Series


RN Series


RZ Series, Pinnacle

Controls
(WSHP, RTU, SELF-CONTAINED, SPLIT SYSTEM, & CHILLER)


VCCX-2


Pioneer Gold


Pioneer Silver

BasX Solutions


Custom Air Handling Units


Data Center Cooling Systems


Modular Cleanrooms

Heating and **Cooling Products** for:

Auditoriums	Health Care Facilities	Manufacturing	Office Buildings	Schools
Convenience Stores	Homes	Museums & Libraries	Restaurants	Supermarkets
Health Clubs	Lodgings	Natatoriums	Retail Store	Indoor Agriculture

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