

# SA/SB Series

Vertical Self-Contained Units  
3-70 Tons



Indoor Air-Handling Units

Indoor Water-Source Heat Pump Units





## SA/SB Series

AAON SA & SB Series self-contained units and indoor air handling units redefine the industry in design, technology, and efficiency. Variable capacity compressors, direct drive backward curved plenum supply fans, and premium double wall foam injected construction allow this series to have unmatched performance.





# 3-70 Tons

AAON sets the standard for commercial self-contained units in performance, construction, and technology.

# Standard Features

- Variable capacity and staged capacity scroll compressors for load matching cooling and improved part load efficiency
- Direct drive backward curved plenum fans
- Flexible fan configurations to meet any job requirements
- Spring isolated fans for reduced sound and vibration levels, available in the SA Series
- Factory provided single or multiple supply air connections available in the SA series, with right, left, back, or top sides of the supply fan plenum
- Improve unit efficiency and design flexibility with counterflow coaxial coils (SB) and brazed plate heat exchanger (SA) options
- Double wall rigid polyurethane foam panel construction with a minimum of R-7.5 value for SB Series and R-13 for SA Series.
- Access doors with full-length stainless steel piano hinges and quarter-turn, lockable handles
- Isolated compressor and controls compartment for easy service and reduced sound
- Double sloped stainless steel drain pans for effective drainage and prevention of standing water that can lead to corrosion and bacterial growth
- Standard five year non-prorated compressor warranty
- Run test report, wiring diagram, and Installation, Operation, and Maintenance manual with startup provided with every unit

## SA SERIES MODULAR DESIGN

SA Series features four capacity sizes with a single air intake (SA-023 to SA-035). These units can also be matched together to provide seven additional sizes which increase the capacity with two air intakes (SA-045 to SA-070).

*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 and exhaust fans (exhaust fans only available on SB) are available for precise airflow control, building pressure control, and reduced power consumption.*

# Construction and Serviceability

## DURABLE, ENERGY-EFFICIENT DESIGN

Double wall construction using closed cell polyurethane foam insulation with G90 galvanized steel walls instead of fiberglass insulation, which can be harmful to indoor air quality. With an insulation R-value of 7.5 or 13, it creates a more rigid and durable assembly with less unwanted heat transfer.

## STREAMLINED INSTALLATION

SB Series units (B cabinet) are designed to fit through standard 36-inch wide by 80-inch tall doors for ease of installation and retrofit applications. C and D cabinets can be shipped from the factory in a split configuration to fit through a standard door opening. SB Series units can be shipped from the factory with a forklift capable base to further ease installation unit run time.



*SA water-source heat pump double configuration for large capacity applications.*

# Configurability

## ENHANCED AIRFLOW AND AIR QUALITY

Improve airflow and air quality by selecting a unit with makeup air capabilities and low leakage AAON economizers, allowing up to 100% outside air. Add modulating reheat to make the unit DOAS certified, providing accurate humidity control for the space.

## FREE LOW AMBIENT COOLING

Factory installed constant or variable flow waterside economizer allows for free cooling at low ambient conditions. Available in the SA Series.

## PRECISE HUMIDITY CONTROL

Modulating humidity control provides energy-efficient dehumidification, even with low sensible heat loads, without the temperature swings common with on/off reheat systems.



SA Series

SA/SB Series meets capacities from 3-70 tons.

# Options

- Humidity control options, include high capacity coils and modulating hot gas reheat
- Available as a DX air handler to match with an air-cooled condenser for application flexibility (SA Only)
- Chilled water cooling coils allow unit to tie into new or existing chilled water system (SA Only)
- Hot water or steam heating coils allow unit to tie into new or existing boiler system
- Polymer e-coated coils for corrosion protection
- Multiple high efficiency air filtration options for improved indoor air quality by reducing airborne allergens and pollutants
- Modulating head pressure control allows unit operation with lower temperature condenser supply water
- Factory installed constant or variable flow waterside economizer allows for free cooling at low ambient conditions (SA Only)
- SCR (Silicon Controlled Rectifier) electric heat control for reduced power consumption, longer heater life, and improved occupant comfort (SB only)
- Interior and exterior corrosion protection is available to protect the cabinet in corrosive environments
- SB Series factory installed mixing boxes with gear driven outside air and return air dampers allow for air side economizer free cooling.
- Factory provided controller can be selected to meet existing or new building control architecture
- Additional customization is available by request for further flexibility in design

## HYBRID PERMANENT MAGNET MOTOR SUPPLY FAN

The SB Series incorporates supply fans driven by the advanced Hybrid Permanent Magnet Motor. This motor achieves an International Efficiency rating above IE5, the highest level of efficiency available today, excelling in efficiency across a range of load conditions, particularly at lower fan speeds.

This exceptional performance makes it the ideal choice for a wide array of applications. Moreover, its use of standard NEMA frames enhances replacement flexibility, setting it apart from proprietary designs and making it the superior choice for your motor needs. NEMA (National Electrical Manufacturers Association) motor frames are available in certain selections.



SB Series

# Low GWP Refrigerant

AAON selected R-454B, a sub 500 GWP refrigerant, to drive the industry towards a cleaner and more sustainable future.

## AIM ACT COMPLIANT

The AIM Act of 2020 empowered the U.S. Environmental Protection Agency to manage Hydrofluorocarbons (HFCs) and regulate refrigerants based on global warming potential (GWP). GWP was developed to compare refrigerants' impact on global warming. The final ruling mandating all new air conditioners to use refrigerants with a GWP below 700 is anticipated to begin January 1, 2025.

AAON thoroughly researched and tested low GWP refrigerants and selected R-454B for its similarity to R-410A in capacity and properties, requiring less product redesign. With a GWP of 466, R-454B is well below the upcoming regulation limits.







# Heat Pumps

The SA and SB Series units offer efficient cooling and heating capabilities with the heat pump option. By reversing the refrigeration circuits, the heat pump provides heating without the need for gas or electric heat, eliminating fossil fuel usage. With potential costs savings compared to gas heating the systems this series is available as an air-source, water-source, or geothermal heat pump.

## **GEOTHERMAL HEAT PUMP**

Geothermal heat pumps use underground pipes and water flow to transfer heat between the building and the earth, leveraging the stable ground temperature ranging from 45° F to 75° F. This method provides efficient heating in the winter and cooling in the summer. Ground water heat pumps utilize bodies of water for heat transfer with the refrigerant.

## **WATER-SOURCE HEAT PUMP**

Water-source heat pumps work in a similar way to geothermal heat pumps except this type of unit utilizes a cooling tower and boiler system. A typical WSHP application is a multistory building or large campus.

# Precision Cooling and Heating Control

SA or SB have the options of using variable capacity, depending on the cabinet model, size and application. Modulating compressors allow precise and efficient cooling control.

## **VARIABLE CAPACITY SCROLL COMPRESSORS**

With 10-100% capacity control, these scroll compressors can match the load needed by the unit. The compressors vary the volume of refrigerant that flows through the cooling system, allowing the unit to tightly control the air temperature and save energy.

## **VARIABLE SPEED SUPPLY FANS**

VFD controlled direct drive backward curved supply fans provide precise airflow control and reduced power consumption. Direct drive fans do not have belt driven energy losses and backward curved plenum fans are more energy efficient than housed forward curved fans.



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



## Indoor Air Quality

### **FILTRATION**

ASHRAE recommends using a minimum of MERV 13 filter to effectively trap viruses more effectively. This option is available on all sizes and the standard backward curved supply fans are capable of handling the additional static pressure associated with the higher quality filtration. AAON offers up to MERV 14 pleated air filters.

### **AAONAIRE® ENERGY RECOVERY WHEELS**

AAONAIRE® energy recovery wheels, total or sensible, provide energy savings by recycling energy instead of losing energy through the exhaust air stream. AAONAIRE systems also enhance indoor air quality by allowing larger amounts of outside air to be provided to the space with improved humidity control. Available in the SB Series.

SA Series			
Intake	23-35 tons - Single		
	45-70 tons - Double		
Nominal cfm	SA-023	6,900	
	SA-028	8,400	
	SA-030	9,000	
	SA-035	10,500	
	SA-045	13,500	
	SA-050	15,000	
	SA-055	16,500	
	SA-058	17,400	
	SA-060	18,000	
	SA-065	19,500	
SA-070	21,000		
Dimensions*	Single - W*: 55 H: 111-135 L: 79		
	Double - W*: 110 † H: 111-135 L: 79		



The SA Series provides a versatile configuration for chilled water and water-source heat pump configurations for larger tonnage applications. Its compact size allows for seamless installation in mechanical rooms with options to add on a waterside economizer.

*\*Dimensions vary depending on options selected. All dimensions are in inches.  
 † Double intake units can be split in half for ease of installation.  
 Maximum cfm may be 30-50% greater than nominal cfm.  
 Unit height in 4" increments.*

SB Series			
Nominal cfm	B	SB-003	1,000-2,000
		SB-004	
		SB-005	
	C	SB-006	1,800-4,000
		SB-007	
		SB-009	
		SB-010	
	D	SB-014	3,000-6,000
		SB-016	
		SB-018	
Dimensions*	B Cabinet - W: 30 H: 53 L: 66		
	C Cabinet - W: 42 H: 78 L: 66		
	D Cabinet - W: 56 H: 78 L: 66		



The SB Series provides accurate control for both full load and part load conditions to meet the need of an application.

*\*Dimensions vary depending on options selected. All dimensions are in inches. Design cfm may be 30-50% greater or less than nominal cfm. Units can be shipped in a split configuration for ease of installation such that each section will fit through a standard 36" door.*



Built to last.  
Built for you.



There's a confidence that comes from knowing you've chosen the best. Because our operations are as efficient as our HVAC systems, you get premier AAON quality at a reasonable price. Outstanding serviceability and support create lifetime AAON customers.





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