

# VSWSHP – Vertical Stack Water Source Heat Pumps

## A full portfolio of solutions for comfort applications

0.75 – 3 Tons, with Efficiencies up to 17.1 EER, 5.1 COP



*SIMPLY THE BEST SOLUTION AND QUALITY PRODUCT*

*— HVACR SYSTEMS*

## Overview

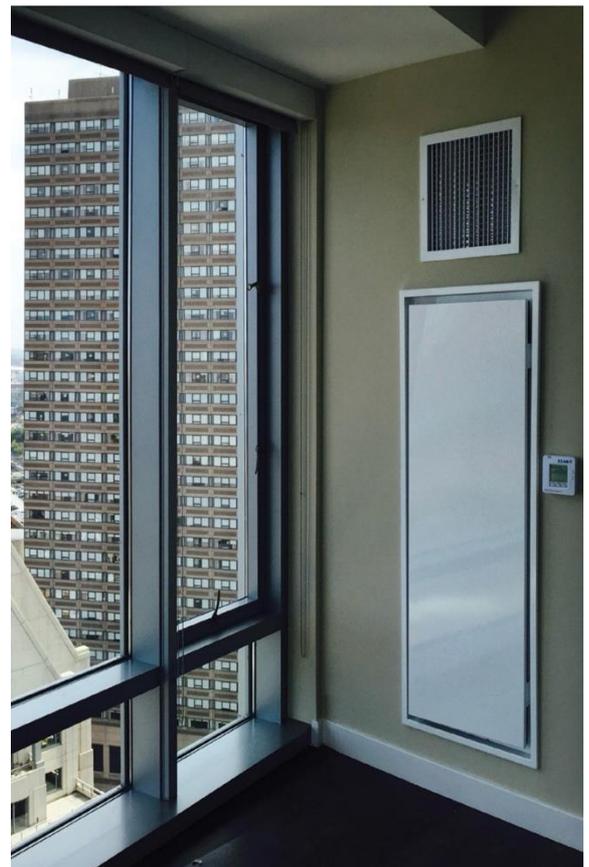
Quiet Comfort...Efficient Control...Flexible Design

Withair® Vertical Stack Water Source Heat Pumps provide an ideal solution for a whisper quiet cooling and heating within a tight footprint that provides an efficient room by room source for comfort conditioning of your living environment. The replacement unit is engineered to fit into the existing cabinet space with matching electrical/water connections as the original unit.

Withair® Vertical Stack Water Source Heat Pumps are built to a high standard of quality and reliability, employing commercial grade components and heavy duty, galvanized sheet metal casings. With proper maintenance and usage, Units should provide many years of efficient, quiet and trouble-free comfort.

Maintaining the highest quality product means Withair's products meet all UL standards and conform to ASHRAE 90.1, local building codes and energy standards.

Every project is different with distinctive needs outside of providing comfort to the space. Withair's units are available in a multitude of configurations with a wide variety of options and accessories to create a custom design tailored to the needs of the project.



## Features of VSWSHP

### VSWSHP – Vertical Stack Water Source Heat Pump

#### Deliver High-performance Heating and Cooling with Exceptional Efficiency and Zero Emissions Parts

Withair® VSWSHP is a floor mounted, and designed to be hidden from view behind drywall to blend with the room's natural decoration, offer superior value – efficiently heating and cooling with full thermal and acoustical insulation, advanced electronic control interface, high and low pressure protection, and condensate overflow sensors.

We offer a wide variety of applications for schools, office buildings, health care/rehabilitation facilities, condominiums, retirement facilities and more.

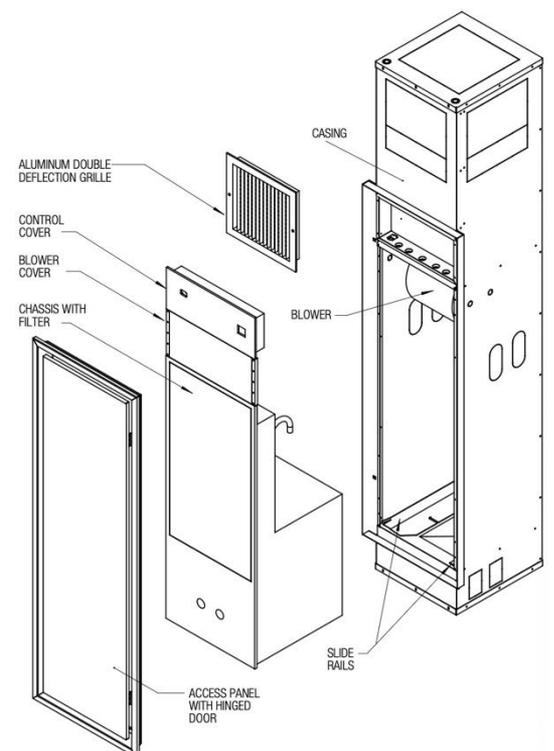
WSHPs are built with superior quality materials and manufacturing practices. Paired with precisely-sized air handling components and thermal and sound insulation, Water Source Heat Pumps deliver low sound levels while achieving optimum comfort. Work without distraction. Sleep without noise. Our Water Source Heat Pumps create a comfortable environment so quiet it's almost undetectable.

In multi-story buildings, the units may be stacked one on top of the other to minimize piping and electrical costs. Supply, return and condensate riser piping may be factory mounted to simplify job site installation of the equipment. The high-rise configuration is often used in hotels, dorms and assisted living facilities where a single unit could provide comfort to a single or multiple room dwelling. Because the units are mounted directly in the space, ductwork is optional.

All water source heat pumps are commissioned, tested and quality certified prior to leaving the factory. This assures global quality standards from controls, water, refrigeration, and aesthetics to the building owner and installing contractor.

#### Key Features Include Features:

- Heavy gauge G90 galvanized steel construction
- Exceeds ASHRAE 90.1-standards for efficiency
- Removable/replaceable chassis
- Ducted and free discharge cabinet selections available
- Plug-in chassis and plug-in thermostat design
- Factory supplied riser options
- Maintenance accessibility for coil fin cleaning
- Unit mounted switch and fuse option
- Lower height cabinet for ducted applications
- Powder painted and Stainless steel drain pan options
- Integrated factory mounted, wired and tested controls
- Lower-GWP R-454B refrigerant and factory installed leak detection systems as required by UL 60335-2-40
- Through the front high and low pressure service ports accessible
- Factory mounted flow control with strainer & isolation valve option



## Chassis Replacement

### Vertical Stack Water Source Heat Pump Chassis

#### When it's time to replace your Vertical WSHP chassis...you want to install the best parts.

The Chassis Replacement is designed to exactly replace the original Vertical Stacked Water Source Heat Pump (WSHP) and provides environmentally friendly cooling and heating where individual, quiet control is a priority.

Featuring Chassis Replacement is dimensionally identical to the original for a fast, easy, and trouble-free installation. Quality components, careful design and testing and the latest in environmentally friendly technology advances mean long unit life, user satisfaction and lower energy costs. No field modification kits or builder renovations required.

#### Withair® has the replacement solution the competition can't match.

The application-flexible chassis is a part of a complete system, which consists of the chassis, blower section, control box, and furred-in room cabinet with risers. The chassis contains the compressor, air side heat exchanger, water side heat exchanger, and refrigerant circuit control and safety components.

#### Standard Features:

- Heavy gauge G90 galvanized steel construction
- Powder painted and Stainless steel drain pan options
- Lock out circuit with reset or circuit breaker
- High pressure switch
- Frost-free cooling
- Water coil freeze protection
- Refrigerant circuit access ports
- Precision selected capillary tube refrigerant control
- Positive shift reversing valve
- Precision charged with R-454B A2L refrigerant
- 1/2 Inch FPT connections
- High efficiency copper tube-aluminum fin evaporator coil
- High efficiency coaxial condenser coil with low water-side pressure drop
- Chassis pull handle facilitates easy chassis removal and handling
- Designed for easy installation and compatibility. Dimensionally identical to the original chassis.
- Quiet, durable, and efficient compressor with built-in pressure and temperature protection



#### Application and Benefits

##### \* Fast and Easy Replacement

The replacement chassis fits the existing room cabinets and works with the existing blower section and control box without modification. Because the chassis dimensions and construction details are like the original, replacement work is fast and easy. The chassis installs without the need for water loop shut-down or draining. Water, drain and electrical connections line right up to the original installation. The electrical connectors plug directly into the control box connectors. A chassis pull handle is provided to facilitate easy removal and handling. Using our chassis replacements eliminate the need for room renovation, redecorating, and piping changes and is the solution that gets your property back in service quickly and at the lowest total cost.

##### \* Damage Protection

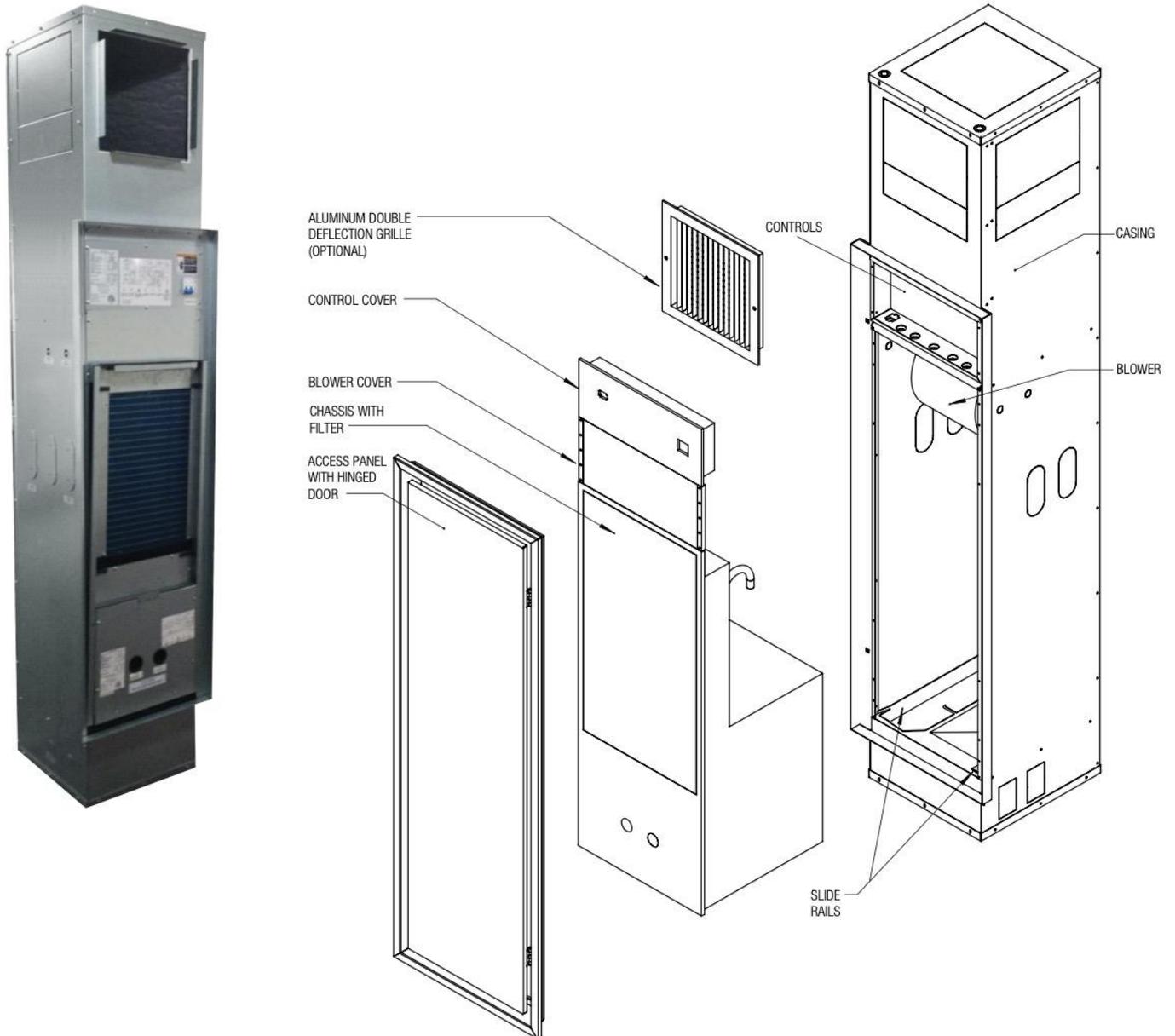
The standard high-pressure switch and evaporator coil freeze protection stops unit operation before damage occurs, should airflow become reduced or obstructed due to dirty coils, obstructed airflow, or motor failure or lock up. A freezing protects the water coil from freeze damage due to water temperature or flow problems. The water coil is designed for low water-side pressure drop, eliminating potential pump sizing and water flow problems.

##### \* Options and Accessories

- Blower sections
- Return air panels
- Control options
- Hose kits
- Flow control valve

## Components and Parts Exploded View

### Vertical Stack Water Source Heat Pump



**Basic Construction:** The cabinet panels shall be fabricated from heavy gauge galvanized steel. Cabinet shall be constructed so that it is self-supporting, and can be installed before chassis arrival. Top, base, and exterior panels are to be G90 gauge. Cabinet shall have a top panel and a bottom panel for structural rigidity of the cabinet; no “open” top or “open” bottom designs allowed.

**Include:** Cabinet, Fan and Motor Assembly, Chassis, Valve Package, Refrigerant Circuit, Cabinet Drain Pan, Electricals, Control System, Supply Grilles, Front/Return panel, etc.

## Data Sheets

### Vertical Stack Water Source Heat Pump

Model No. W01R2-					Water Loop Heat Pump				Ground Loop Heat Pump				Size & Weight		
					Cooling 86°F (30°C)		Heating 68°F (20°C)		Cooling 77°F (25°C)		Heating 32°F (0°C)		Size	Weight	
Unit Size	Refrig.	COMP	Waterflow GPM (m³/h)	Airflow CFM (m³/h)	Capacity Btu/hr (Watts)	EER Btu/hr/W	Capacity Btu/hr (Watts)	COP	Capacity Btu/hr (Watts)	EER Btu/hr/W	Capacity Btu/hr (Watts)	COP	W*D*H (in)	Cabinet (lb)	Chassis (lb)
<b>026VS</b> (0.75Tons)	R-454B	Rotary	2.3 (0.52)	300 (510)	8,900 (2,608)	14.3	11,600 (3,400)	4.8	9,500 (2,784)	17.1	6,800 (1,993)	3.3	15*15*86	112	76
<b>035VS</b> (1Tons)	R-454B	Rotary	3.0 (0.68)	400 (680)	12,100 (3,546)	14.4	14,600 (4,280)	4.7	12,800 (3,751)	17.1	9,500 (2,785)	3.6	15*15*86	112	95
<b>045VS</b> (1.25Tons)	R-454B	Rotary	3.8 (0.86)	500 (850)	15,200 (4,454)	14.4	19,900 (5,830)	5.1	15,900 (4,660)	16.8	11,900 (3,488)	3.5	18*18*86	145	100
<b>058VS</b> (1.5Tons)	R-454B	Rotary	4.4 (1.0)	600 (1,020)	18,100 (5,305)	14.1	23,900 (7,000)	4.6	18,800 (5,510)	16.3	14,500 (4,250)	3.5	18*18*86	145	105
<b>072VS</b> (2Tons)	R-454B	Scroll	6.5 (1.48)	800 (1,360)	24,300 (7,120)	13.8	31,000 (9,085)	4.5	25,100 (7,356)	15.8	21,200 (6,213)	3.4	20*20*86	228	160
<b>086VS</b> (2.5Tons)	R-454B	Scroll	7.5 (1.7)	900 (1,530)	29,500 (8,646)	13.7	38,800 (11,370)	4.4	30,300 (8,880)	15.4	21,700 (6,360)	3.3	22*22*86	228	166
<b>105VS</b> (3Tons)	R-454B	Scroll	9.0 (2.0)	1,200 (2,039)	36,100 (10,580)	13.6	44,800 (13,130)	4.3	36,900 (10,815)	15.2	27,500 (8,060)	3.2	25*25*86	246	182

Notes:

- Rated in accordance ANSI/AHRI/ASHRAE/ISO13256-1 & GB/T19409-2003.
- Test conditions are 80.6 °F(27°C) DB/66.2 °F(18.8°C) WB EAT in cooling and 68 °F(20°C) DB/59 °F(15°C) WB EAT in heating.
- Entering liquid temperature in cooling is 86°F(30°C) for Water Loop, 77°F(25°C) for Ground Loop, and 59°F(15°C) for Ground Water.
- Entering liquid temperature in heating is 68°F(20°C) for Water Loop, 32°F(0°C) for Ground Loop, and 50°F(10°C) for Ground Water.
- EER = Energy Efficiency Ratio, COP = Coefficient of Performance.

### Electrical Data

Model No. W01R2-	026VS	035VS	045VS	058VS	072VS	086VS	105VS
Voltage/Ph/Hz	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
Compressor RLA	4.1	5.4	5.4	7.4	9.9	11.6	15.5
Compressor LRA	20.0	27.0	27.0	42.0	55.4	60.2	75.6
Fan Motor FLA	0.7	0.7	2.0	2.0	1.9	1.9	4.0
MCA	5.8	7.5	8.0	11.2	14.4	16.5	23.3
MOP	10	12	13	19	24	28	39
Fuse Size	15	15	15	15	20	25	35

### Typical Water Side Data

Model No. W01R2-	026VS	035VS	045VS	058VS	072VS	086VS	105VS
Flow rate (GPM)	2.3	3.0	3.8	4.5	6.0	7.5	9.0
Water Connection (in)	1/2	1/2	1/2	1/2	3/4	3/4	3/4
Condensate Connection (in)	3/4	3/4	3/4	3/4	3/4	3/4	3/4

### Unit Operating Limits

Mode	Cooling (°F)	Heating (°F)
Ambient Air Mix-Max DB	50-100	50-85
Return Air Min DB/WB	65 - 60	50
Return Air Max DB/WB	95 - 75	80
Entering Water Min-Max	60-110	60-90

Note: Due to Withair's ongoing product development programs, the information in this document is subject to change without notice.

## Data Sheets

### Vertical Stack Water Source Heat Pump

#### Air Flow Correction Table

% of Rated Air Flow		70%	75%	80%	85%	90%	95%	100%	105%
Cooling Factors	Total Capacity	0.92	0.93	0.95	0.96	0.97	0.99	1.00	1.02
	Sensible Capacity	0.80	0.83	0.87	0.90	0.93	0.97	1.00	1.04
	Power	0.97	0.97	0.98	0.99	0.99	1.00	1.00	1.00
	Heat Rejection	0.94	0.95	0.96	0.97	0.98	0.99	1.00	1.01
Heating Factors	Heating Capacity	0.94	0.95	0.96	0.97	0.98	0.99	1.00	1.01
	Power	1.08	1.06	1.05	1.04	1.02	1.01	1.00	0.99
	Heat Rejection	0.93	0.95	0.96	0.97	0.98	0.99	1.00	1.01

#### Air Temperature Correction Table

HEATING								
EAT DB (°F)	45	50	55	60	65	70	75	80
Heating Capacity Factor	1.11	1.09	1.06	1.04	1.02	1.00	0.98	0.95
Power Factor	0.77	0.81	0.86	0.91	0.95	1.00	1.05	1.10
Heat Extraction Factor	1.18	1.14	1.11	1.07	1.04	1.00	0.96	0.92

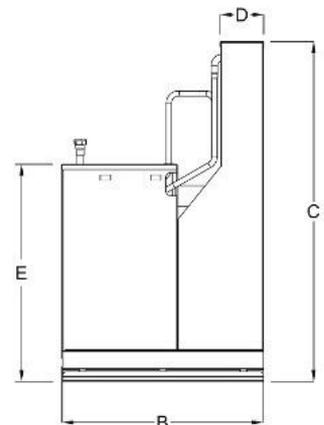
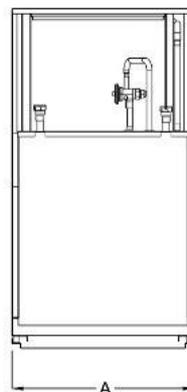
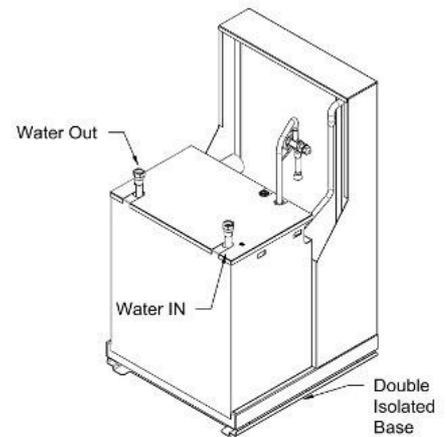
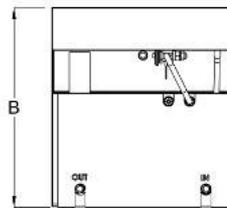
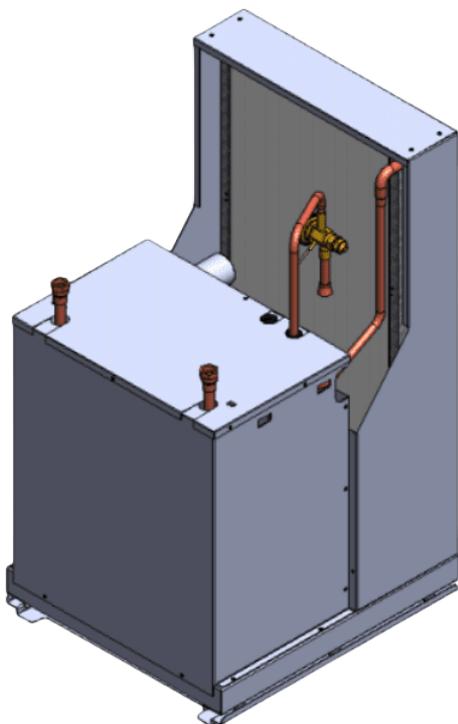
COOLING						
EAT WB (°F)		60	65	67	70	75
Total Capacity Factor		0.85	0.96	1.00	1.06	1.17
Sensible Capacity Factor EAT DB	70	0.85	0.62	0.52		
	75	1.09	0.86	0.76	0.62	
	80	1.33	1.09	1.00	0.86	0.63
	85	*	1.33	1.23	1.09	0.85
	90	*	*	1.48	1.34	1.10
	95	*	*	*	1.56	1.32
Power Factor		1.00	1.00	1.00	1.00	1.01
Heat Rejection Factor		0.90	0.97	1.00	1.05	1.12

## Data Sheets

### Vertical Stack Water Source Heat Pump Chassis

Model No.	Unit Size (Tons)	Refrigerant	Waterflow (CFM)	Airflow (CFM)	Cooling Capacity		Heating Capacity		WPD	
					Btu/h	EER	Btu/h	COP	PSI	FT
W01R2-026VSC	0.75	R-454B	2.3	300	8,900	14.3	11,600	4.8	4.3	10
W01R2-035VSC	1	R-454B	3.0	400	12,100	14.4	14,600	4.7	4.5	10
W01R2-045VSC	1.25	R-454B	3.8	500	15,200	14.4	19,900	5.1	4.9	11
W01R2-058VSC	1.5	R-454B	4.4	600	18,100	14.1	23,900	4.6	4.9	11
W01R2-072VSC	2	R-454B	6.5	800	24,300	13.8	31,000	4.5	5.1	12
W01R2-086VSC	2.5	R-454B	7.5	900	29,500	13.7	38,800	4.4	6.5	15
W01R2-105VSC	3	R-454B	9.0	1,200	36,100	13.6	44,800	4.3	5.6	13

Model No.	Dimensions (inches)					Water Connection		Weight (lbs)
	A	B	C	D	E	OUTLET	INLET	
W01R2-026VSC	13	13	32	3	20	1/2 FPT	1/2 FPT	76
W01R2-035VSC	13	13	32	3	20	1/2 FPT	1/2 FPT	95
W01R2-045VSC	16	16	32	4	20	1/2 FPT	1/2 FPT	100
W01R2-058VSC	16	16	32	4	20	1/2 FPT	1/2 FPT	105
W01R2-072VSC	18	18	34	4	22	3/4 FPT	3/4 FPT	160
W01R2-086VSC	20	20	34	5	22	3/4 FPT	3/4 FPT	166
W01R2-105VSC	23	23	35	5	24	3/4 FPT	3/4 FPT	182



Note: Due to Withair's ongoing product development programs, the information in this document is subject to change without notice.

## Products Family

# Withair® HVACR SYSTEM SOLUTIONS OFFERING -

A full portfolio of solutions for comfort and process applications

### Air-cooled Chillers & Heat Pumps

- Extensive Lineup: 2 to 460 tons
- Meet ASHRAE® 90.1 standards
- ECM fans reduce sound, energy usage
- Reliable heating down to -31°F (-35°C) ambient
- Air-Cooled Liquid Process Chiller
- Integrated Free-cooling
- 4-pipe Simultaneous Cooling and Heating
- Industrial Use High Temperature Heat Pumps



### Packaged RTU & DX Split Units

- Full portfolio: 3 to 250 tons
- R-454B Low-GWP Refrigerant
- Supply air temp. as low as 41°F (5°C)
- Cooling, Heat Pump & Air Handler
- Efficiency Ratings up to 20.3 IEER
- Deliver precision temperature control
- Dedicated Outdoor Air Systems (DOAS)



### Water-cooled Chillers & Heat Pumps

- Extensive Lineup: 0.75 to 1,000 tons
- BAS (BACnet® or Modbus®) options
- Provides simultaneous heating and cooling
- Outstanding energy efficiency, up to 40 EER
- R-410A, R-454B, R-134a & R-513A refrigerant
- Water-Cooled Screw Chiller with Integrated VFD
- Industrial process cooling / heating applications
- 6-pipe design features 3 independent water loops



### Air Side Devices

- Air flow range: 150 to 35,000 CFM
- Direct-drive – ECM Fan
- CW/HW – 2-pipe or 4-pipe
- Compact design, low profile
- Fast customization and delivery
- Factory-wired thermostat, BACnet as option
- Life Air System (low temp. regeneration desiccant wheel)



## About Withair

Withair® has over 20 years of industry experience in developing and manufacturing a wide variety of HVACR units to provide superior new construction heating and cooling systems and to replace old installations. Withair® offers advanced green technologies and provides world-class comfort at high efficiency levels, meeting environmental standards and promoting a healthy environment.

Withair's state-of-the-art units can be equipped with digital controls designed to optimize user comfort and ease of operation. Withair's products are designed to provide years of trouble-free operation and reliable performance in multi-family housing, hotels/motels, dormitories, commercial buildings, industrial applications and similar projects. Units are ideal for new construction, retrofit and replacement applications.

$$Q_S = C_p \cdot \rho \cdot L \cdot (T_1 - T_2)$$

$$Q_L = 600 \cdot \rho \cdot L \cdot (W_1 - W_2)$$

$$L = Q_S / C_p \cdot \rho \cdot (T_1 - T_2)$$

$$R = L \cdot X \cdot 1.3 \cdot (h_1 - h_2)$$



## Integration & Interoperability of HVACR Devices

We offer comprehensive and energy-efficient heating, cooling ventilation, and air conditioning solutions for different types of spaces of varying cubic volumes. A wide range of equipment allows for the selection of simple solutions, as well as advanced HVACR systems that can be centrally controlled, providing a high level of comfort for the user along with energy efficiency.

### Core Strengths Include

#### Innovative Technologies

##### \* Simulation Design and Digital Virtual Prototype

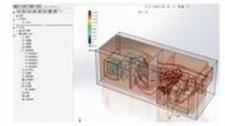
###### Refrigeration System Simulation



Four highlights



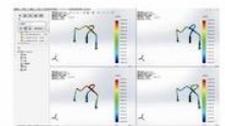
###### CFD Simulation



###### Electrical Simulation



###### Vibration Simulation



Withair's innovative digital virtual prototype plays a crucial role in the implementation of the customized products and entire project. The digital prototype is completely different from the traditional physical prototype design, which completely subverts the long backward design process of traditional HVACR products, which is to prototype first, and then test and then improve.

The digital prototype fully utilized, throughout the implementation of the entire project. Withair's database based simulation platform, it encompasses every step, from refrigeration system simulation, airflow simulation, electrical simulation, to vibration simulation, it boosts numerous technological heights.

We can cooperate with you in project design and process work. Provide products and process selection advice at the beginning of your project design, reducing your design selection world, and reducing your trial-and-error costs and purchasing costs. We invite your team to discuss technical issues together.



Premium Manufacturer of Cooling, Heating, and Indoor Air Quality Solutions



## About Withair

### Quality Assurance

We have established a reliable quality management system and equipped with professional testing equipment. Sometimes our quality inspection standards are stricter than the customer's acceptance standards. It is divided into multiple quality control links, such as self-inspection, mutual inspection and general inspection, on-line testing. Our products have gone through the cruel "hard test" of nature and work reliability.

**Quality Supply Chain — Strong cooperation and creating good quality**

#### COMPRESSORS COMPONENTS



#### REFRIGERATION COMPONENTS



#### CONTROLS & ELECTRICAL



### Competitive Prices

We have the price advantage of purchasing raw materials in bulk. Rational use of systems, an increase in efficiency, less warehouse stock, immediate solutions to any errors, the elimination of waste and a decrease in costs. Reducing time, used space, costs and errors means we are able to respond with maximum flexibility, precision and speed to any customer's requirements, offering the best possible products at competitive prices.



### Fast Delivery

We know how much you care about completing projects on time. As a premium manufacturer, we will provide you with a fast supply chain, flexible logistics, and full technical and commercial support. Benefit from working with a professional provider of solutions.

We carefully sort out the needs of each order, multiple departments do a good job in order review, production planning and production operations are in order, and timely and accurate delivery is guaranteed. We have a good relationship with suppliers and good credit, and suppliers give priority to guaranteeing supply for our orders. 4 to 6 weeks delivery time for the CUSTOM MADE product.



### Flexible Solutions

Work with a professional provider of solutions. We guarantee comprehensive care to our clients at each stage of implementation, from the project, through implementation, to subsequent care of the facility. Become one of Withair's satisfied clients.

They have trusted us:

