



Versatec 700 Indoor DOAS
Formerly the Versatec DOAS
Dedicated Outdoor Air System
with Water Source/Geothermal Heat Pump





Model Shown: DAS360

VERSATEC DOAS FEATURES

WaterFurnace Versatec DOAS is an indoor modular, self-contained DOAS unit that is designed to improve occupant comfort and help maintain building health by efficiently conditioning up to 100% of outdoor air, year-round. With Versatec DOAS, ventilation is handled with a dedicated outdoor air-system that combines WaterFurnace's variable speed WSHP technology with total energy wheels. The Versatec DOAS ships as multiple pieces that can easily fit through a standard 34" door opening with minimal effort. The benefit of this design is to provide maximum flexibility for your ventilation needs while keeping a focus on reducing installation and start up costs.

STANDARD FEATURES

- On-board CFM control and measurement built-in
 - CFM setpoint control over the BAS
 - No field installed air measuring station required
- Maximum dehumidification per ft²
- Communicating controls platform for simple over the network diagnostics
 - BACnet MS/TP
 - BACnet IP
 - Stand-alone configurations
- Load matching capability with variable speed fans, VS compressor, high efficiency wheel
- Flexible configurations for multi-zone VAV, single-zone VAV, and CAV applications
 - Supply air reset
 - Stand-alone or BAS operation
 - Modulating hot gas reheat with head pressure control
 - Demand controlled ventilation
- Exhaust fan control
 - Building pressure relief
 - CFM setpoint control
- Spring assist backdraft dampers prevent airflow back pressure when system is operating in reduce compressor load matching
- AHRI 1060 certified Energy Recovery wheel in double wall rigid polyurethane foam injected cabinet
 - Segmented transfer media for easy removal and cleaning with minimal downtime
 - Channel matrix wheels for maximum performance and optimal efficiency
 - Patented polymer energy transfer media will never corrode
 - Rigid wheel assembly slides out for easy access

OPTIONAL FEATURES

- Advanced and Premium controls options for advanced functionality and additional sensor monitoring
 - Exhaust air enthalpy sensing
 - Optical wheel rotation sensor
 - Differential pressure sensors for wheel & filters
 - CO₂ return air sensor
- Optimize your energy savings by adding economizer to your energy recovery
 - Optional, factory installed enthalpy economizer utilizing modulating outdoor air and exhaust air bypass dampers
 - ▷ Economizers provide up to 40% savings
 - ▷ ASHRAE 90.1 compliant economizer functionality
- Optional dual blower exhaust for higher static applications
- Optional MERV 8, 11, and 13 filter options in 2", or 4" thickness

VERSATEC 700 INDOOR DOAS

Flexible duct configurations provides the engineer with countless options to reduce the footprint in the mechanical room.

CFM control DOAS unit reduces time and cost in the field getting check, test, and balance to match the specification. CFM control over the BAS. With CFM control over the BAS, there is no need for a field installed CFM airflow station

All-aluminum air coils prevent formicary corrosion.

Optical wheel rotation sensor for improved fault detection.

1" double wall construction offers easily cleaned surfaces, reduces noise transmission, and significantly reduces heat loss/gain through the cabinet.



Modulating reheat combined with head pressure control delivers optimal reheat capacity to deliver neutral air to the space.

Built on the Aurora Controls Network.

High efficiency inverter communicates seamlessly with the Aurora controls to provide compressor envelope protection and soft start operation to ensure reliability.

Factory installed water manifolds make for easy installation of the WSHP on larger cfm applications.

2 and 4-inch filters, MERV rating 8, 11 and 13 for cleaner air

Factory installed bypass dampers allow airside economizer functionality



Larger Wheel allows for operation over a wider range without preconditioning. Total effectiveness above 70% provides maximum heat transfer, optimal energy recovery savings, and qualifies for rebates in most areas.

Communicating sensors provide insight to every aspect of the DOAS unit which is all viewable over the BAS.

APPLICATIONS

100 % OUTDOOR AIR SYSTEM

The Versatec DOAS unit is designed to fit a range of variable air volume (VAV) applications such as single-zone VAV, multi-zone VAV, and constant air volume (CAV).

Single-Zone VAV

Single-zone VAV systems have typically been used in larger zones with higher populated areas with variable cooling loads such as churches, meeting rooms, gymnasiums, etc. Single-zone VAV combines aspects of multi-zone VAV and constant air volume (CAV) applications to serve a single-zone/space by using temperature setpoints to enable cooling/heating/dehumidification mode. This application does not contain VAV boxes and the supply blower will operate to maintain the space temperature in the zone.



Model Shown: DAS360

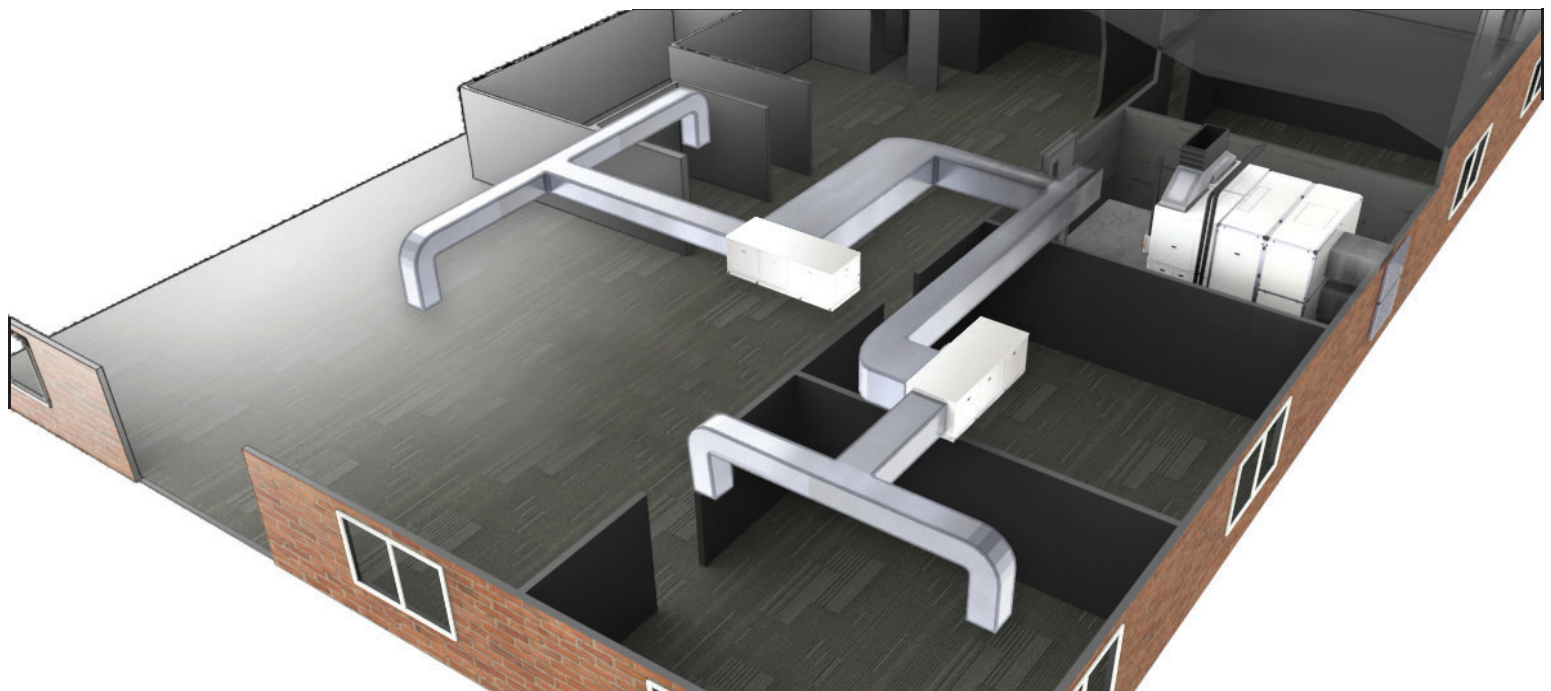
Multi-Zone VAV

For multi-zone applications, the controller is configured to control the supply fan to maintain a duct static pressure setpoint. The variable speed compressor will operate to either a leaving air temperature or evaporator coil temperature in cases where the unit is equipped with modulating hot gas reheat. In cases with modulating hot gas reheat, the reheat valve will operate off of a PID that controls to a leaving air temperature setpoint.

Multi-zone VAV units can be applied in a variety of ways such as operating off of BACnet from a BAS controller or stand-alone operation with or without a thermostat

Constant Air Volume (CAV)

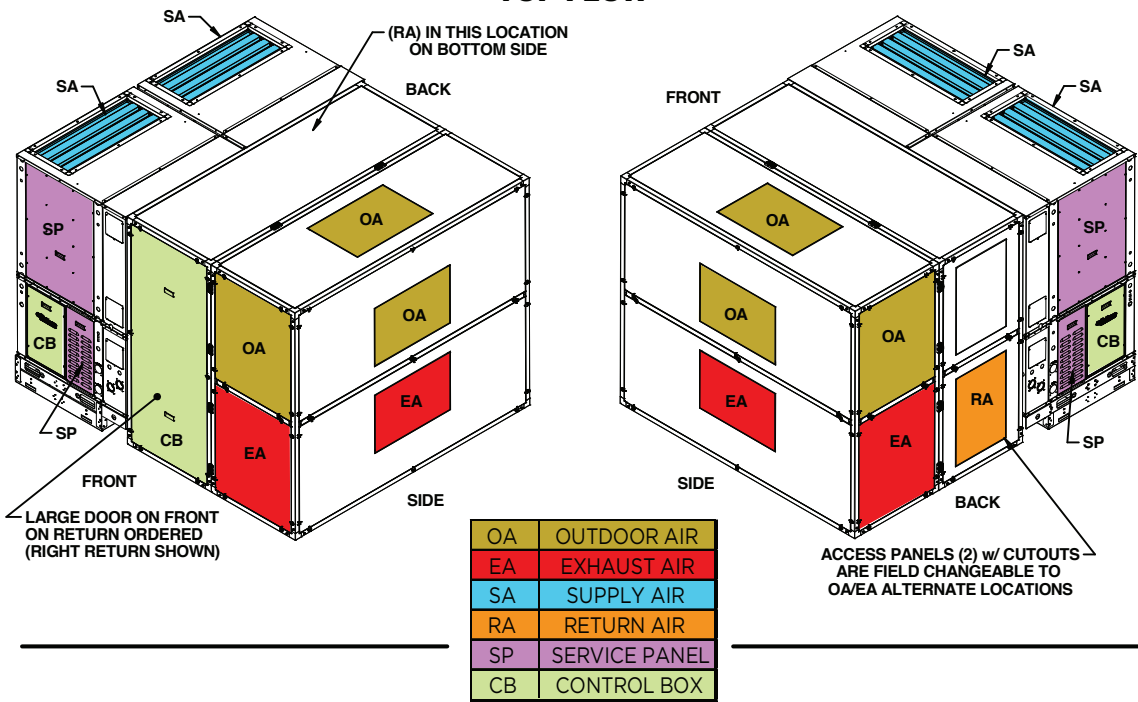
By adjusting the duct static pressure setpoint in the Aurora Premium control to constant, it can turn the VAV controller into a CAV control application. With the exception of the blower modulation, the system will control the compressor to a leaving air temperature and operate with all of the same input configuration points.



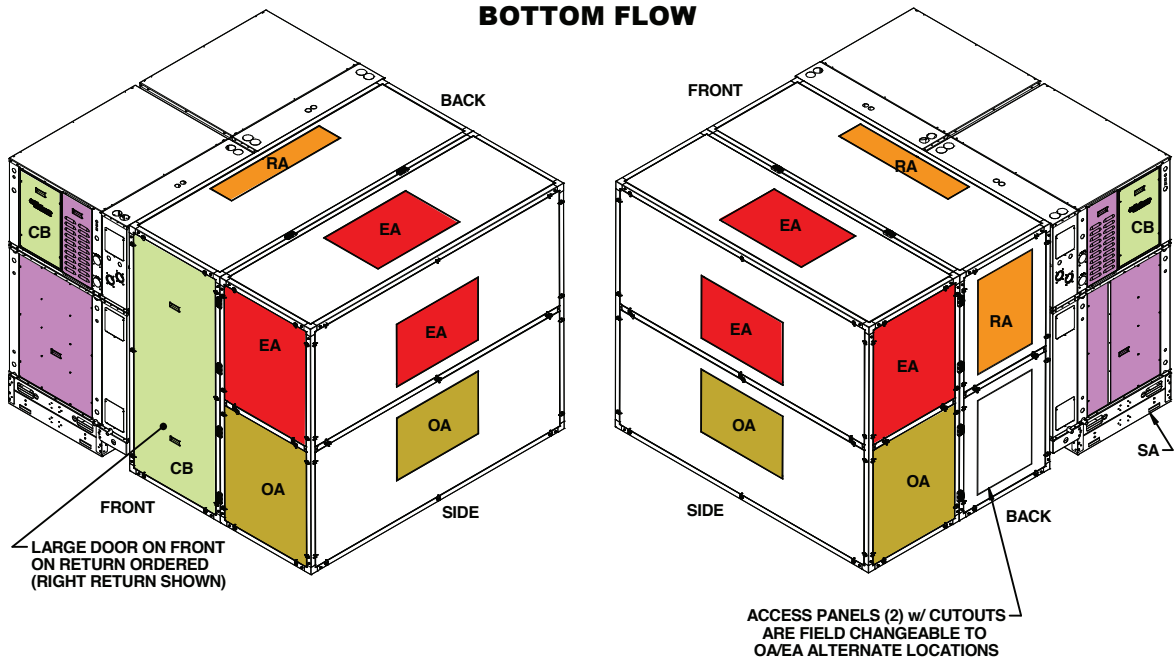
Multi-zone VAV application for office building

FLEXIBLE CONFIGURATIONS FOR FOOTPRINT OPTIMIZATION

TOP FLOW



BOTTOM FLOW

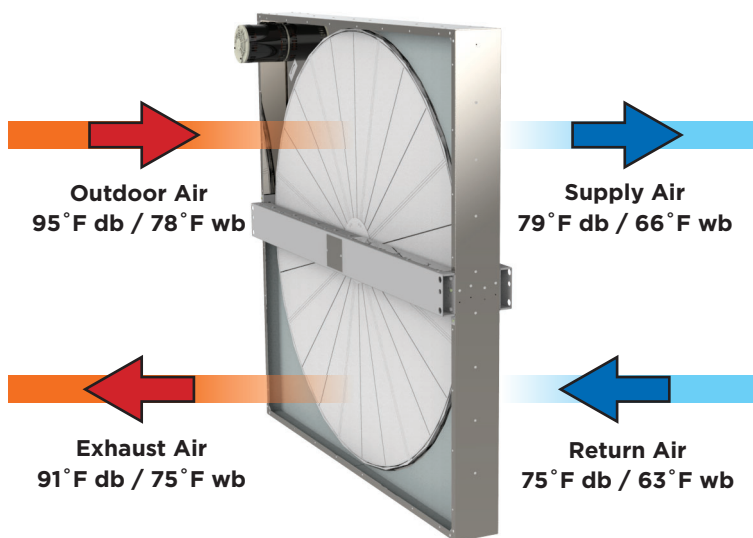


AIR FLOW CONFIGURATIONS

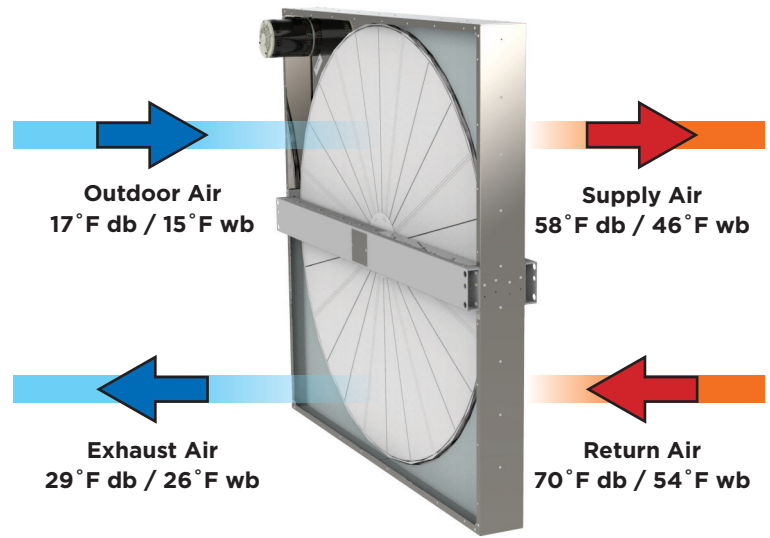
ENERGY RECOVERY

Energy recovery is really energy conservation by transferring energy between the return air in the space to or from the fresh outdoor air. In the summer months, the energy is taken out of the incoming outdoor air stream and exhausted outside, which reduces the load that ventilation imposes on the building. In the winter months, the wheel then recaptures heat from the return that is being exhausted and warms up the incoming air to the building. WaterFurnace only uses total energy wheels that are AHRI 1060 rated in energy recovery applications.

Summer Operation



Winter Operation

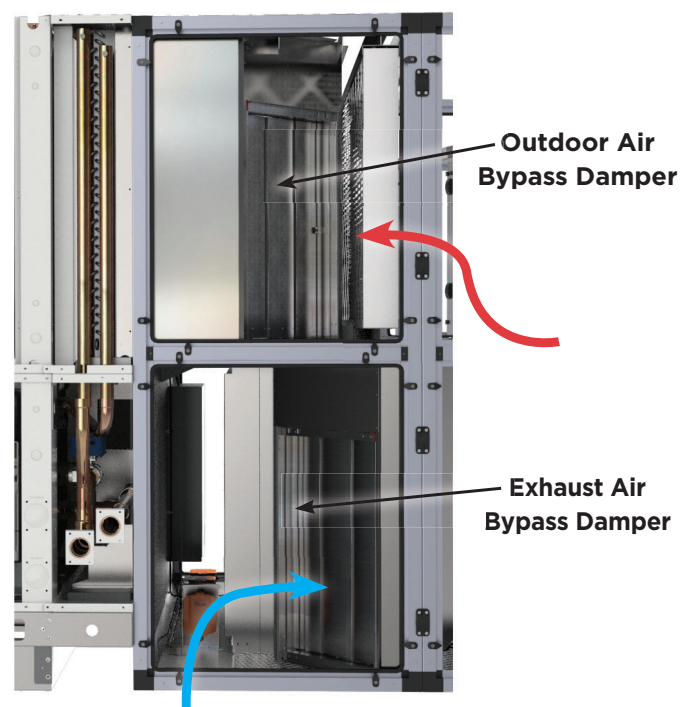


Airside Economizer

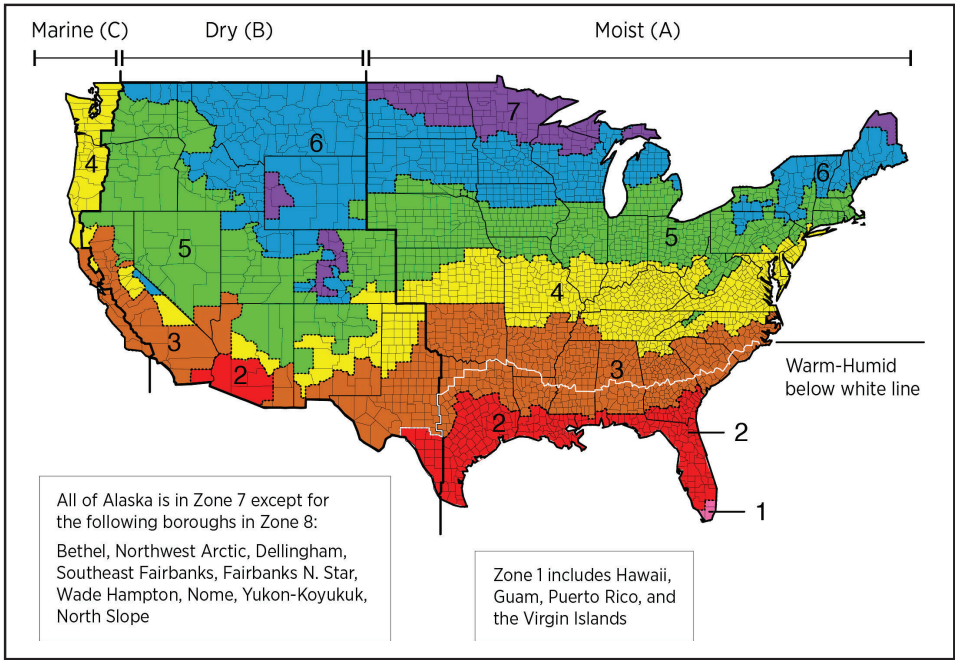
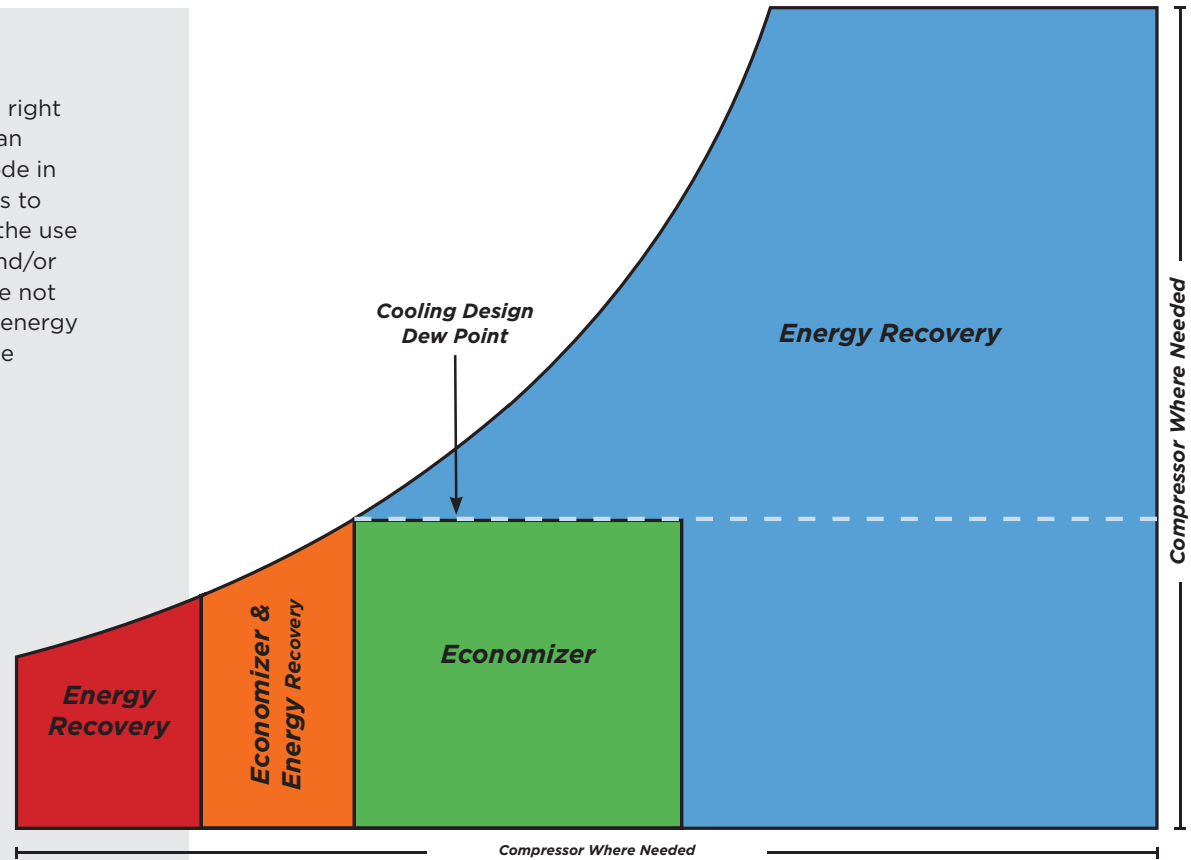
When equipped with factory installed dampers, airside economizer functionality is added to the Versatec DOAS which provides the most economical solution for fresh air exchange without sacrificing occupant comfort. Air bypass dampers are equipped with modulating actuators that communicate seamlessly with the Aurora DOAS controls and viewable over the BAS.

Economizer benefit

- Reduce fan power consumption by eliminating pressure drop when the wheel is off.
- Bypass dampers can modulate to provide the right balance of temperature control at the lowest operating cost.



As you can see on the psychometric chart to the right the Versatec DOAS unit can utilize the economizer mode in many operating conditions to save energy, by reducing the use of the Energy Recovery and/or Compressor when they are not needed. This reduction in energy usage will also improve the system payback for the building owner.



Zone	Percentage of Outdoor Air at Full Design Airflow Rate (CFM)					
	30% ≤ 40%	40% ≤ 50%	50% ≤ 60%	60% ≤ 70%	70% ≤ 80%	≥ 80%
Design Supply Fan Airflow Rate (CFM)						
3B, 3C, 4B, 4C, 5B	NR	NR	NR	NR	≥ 5,000	≥ 5,000
1B, 2B, 5C	NR	NR	≥ 26,000	≥ 12,000	≥ 5,000	≥ 4,000
6B	≥ 11,000	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,500	≥ 1,500
1A, 2A, 3A, 4A, 5A, 6A	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,000	≥ 1,000	≥ 0
7, 8	≥ 2,500	≥ 1,000	≥ 0	≥ 0	≥ 0	≥ 0

NR = Not recommended

ASHRAE Climate Zone Map

WHY USE ENERGY RECOVERY?

Providing 100% outdoor air ventilation adds significant heating and cooling loads to the building that the DOAS unit must condition. That is why ASHARE 90.1-2010 requires the use of an energy recovery device to be used depending on the design supply airflow rate, geographic location of the building, and the percentage of outdoor air that is needed. The standard mandates that the total effectiveness of the energy recovery system be at least 50% when it is required.

The effectiveness of the device depends on several variables such as the type and material of the energy recovery heat exchanger, the airflow configurations, and how the make-up air and exhaust air are balanced. The performance method for testing and rating of the energy recovery device is based on AHRI Standard 1060.

PAYBACK ANALYSIS

Here's an example in 3 of the ASHRAE climate zones that demonstrate value of WaterFurnace's Versatec DOAS unit with exhaust air energy recovery. The example below shows Chicago, IL which is in zone 5A which is considered Cool Humid based on ASHRAE terminology.

In this example, the following flow rates, utility rates, and efficiency levels are used.

ASHRAE Zone	2	4	5
Location	Houston, TX	Nashville, TN	Chicago, IL
Outdoor Airflow Rate, cfm	4000	4000	4000
Exhaust Airflow Rate, cfm	4000	4000	4000
Electric Utility Rate, \$/kW-h	0.10	0.10	0.10
Fuel Rate, \$/MMBtu	10	10	10
Gas Heating Efficiency, %	82%	82%	82%
Baseline Cooling Efficiency, EER	10	10	10
Versatec DOAS (DAS180), EER	14.5-22.0	14.5-22.0	14.5-22.0

The total cooling annual hours are 886 while there are 5412 heating hours.

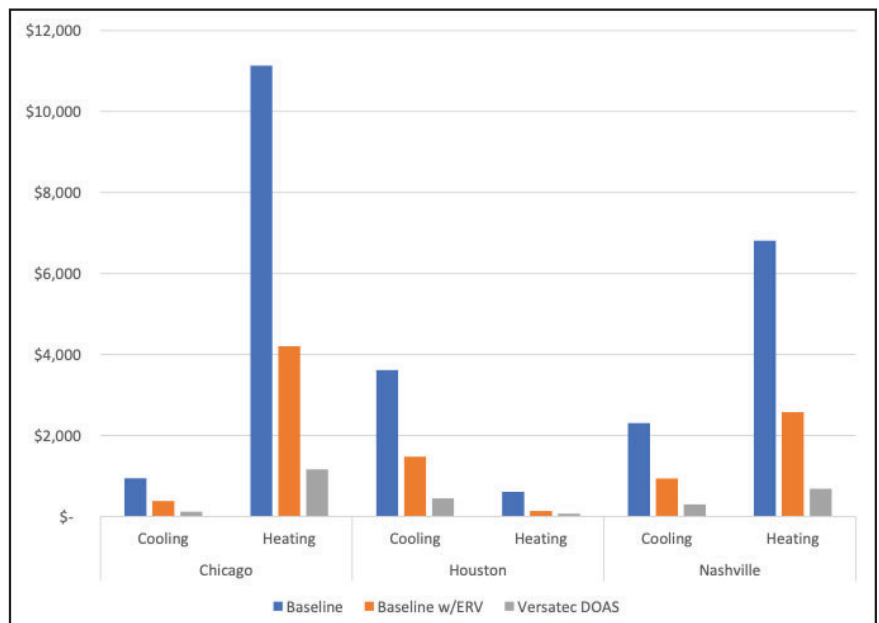
DryBulb	MCWB	Annual Hours	Ventilation Load	Standard Wheel		Versatec DOAS	
				Recovered Load	Net Load	Recovered Load	Net Load
97.5	77.7	1	216,039	129,002	85,999	162,305	53,735
92.5	77.6	40	8,610,567	5,110,207	3,458,958	6,441,342	2,169,225
87.5	72.6	141	19,086,907	11,383,847	7,611,287	14,328,580	4,758,328
82.5	70.5	384	39,254,014	23,240,600	15,824,673	29,317,962	9,936,053
77.5	69.3	320	27,210,749	15,870,131	11,209,782	20,112,071	7,098,678
72.5	52.2	9	(176,110)	(104,565)	(70,698)	(131,807)	(44,304)
67.5	52.4	31	(527,651)	(335,335)	(189,780)	(414,343)	(113,308)
62.5	50.9	177	(5,530,821)	(3,565,549)	(1,938,678)	(4,387,570)	(1,143,250)
57.5	49.9	414	(16,530,019)	(10,824,740)	(5,625,799)	(13,260,810)	(3,269,209)
52.5	47.3	638	(40,897,200)	(26,166,522)	(14,534,035)	(32,267,627)	(8,629,573)
47.5	42.9	528	(54,208,688)	(33,929,574)	(20,018,467)	(42,108,435)	(12,100,253)
42.5	38.9	475	(64,161,041)	(39,787,285)	(24,065,256)	(49,513,688)	(14,647,354)
37.5	33.6	865	(151,487,073)	(93,363,528)	(57,395,162)	(116,400,769)	(35,086,304)
32.5	29.2	759	(156,320,935)	(96,121,272)	(59,448,037)	(119,922,716)	(36,398,219)
27.5	24.8	473	(111,746,320)	(68,591,396)	(42,617,623)	(85,622,245)	(26,124,075)
22.5	20.3	249	(65,919,103)	(40,410,117)	(25,192,033)	(50,463,841)	(15,455,262)
17.5	15.9	382	(111,139,870)	(68,109,864)	(42,495,622)	(85,064,415)	(26,075,455)
12.5	10.1	157	(50,698,606)	(31,059,460)	(19,395,377)	(38,795,558)	(11,903,048)
7.5	5.7	108	(37,393,721)	(22,916,739)	(14,297,185)	(28,621,959)	(8,771,762)
2.5	0.6	83	(30,843,345)	(18,907,330)	(11,787,713)	(23,612,827)	(7,230,519)
-2.5	-3.8	39	(15,337,067)	(9,404,549)	(5,858,774)	(11,744,167)	(3,592,900)
Cooling Total			\$943.84	\$557.37	\$381.93	\$703.66	\$118.48
Heating Total			\$11,133.14	\$6,873.14	\$4,206.47	\$8,565.03	\$1,166.56

Baseline DOASCooling \$944 | Heating \$11,133

Baseline with
Energy RecoveryCooling \$382 | Heating \$4206

Versatec DOAS with
Energy RecoveryCooling \$118 | Heating \$1167

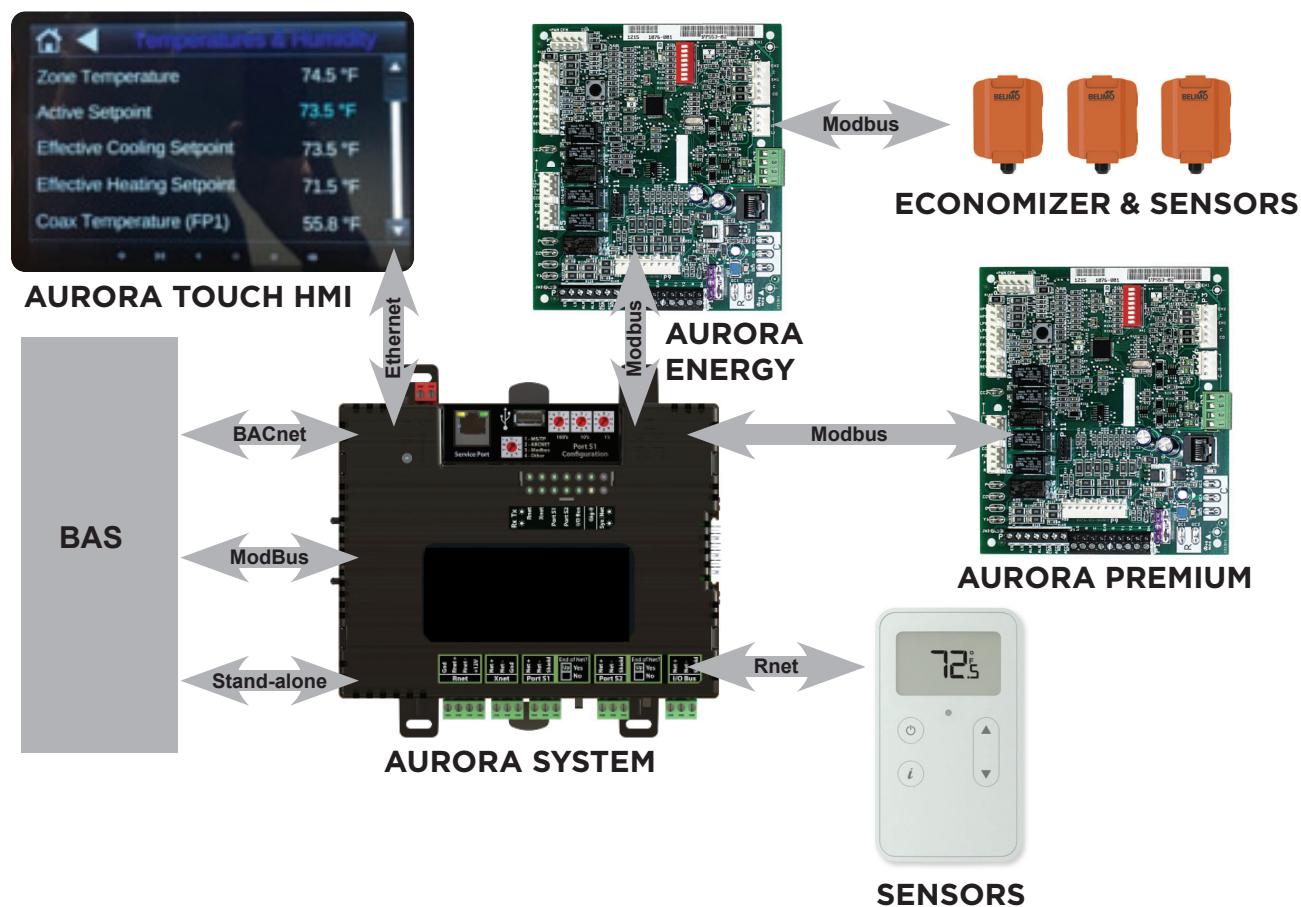
**Additional saving are available
by adding the airside economizer
with Aurora Energy Advanced
Control option.**



INTEGRATED CONTROLS PLATFORM

The Versatec DOAS unit operates on the Aurora Controls Network (ACN) which brings together different technologies such as variable speed compressors, direct drive ECM plenum fans, electronic expansion valves, CFM control, and total energy recovery to provide a complete DOAS unit. The Versatec DOAS control platform consists of the Aurora System controller, Aurora Energy Control (AEC), and Aurora Premium. The AEC is a complete microprocessor which functions as the state engine management of the air-to-air energy recovery equipment. It controls the operation of the energy wheel, bypass dampers, exhaust blowers, and reads any sensors that are enabled on the energy recovery unit. It also provide safety features of the energy recovery unit. The Aurora Heat Pump control provides state engine management for the variable speed heat pump system. It will communicate to the supply blower, inverter board, and other communicating devices or sensors that are enabled on the heat pump. The Aurora DOAS controller is the application controller that provides all the decision making for the DOAS unit, provides setpoints and overrides to the heat pump and energy recovery units.

- Simplified diagnostics for the DOAS system with intuitive large touch screen display with the Aurora Touch Tablet2
- All sensors communicate over modbus and are reportable to the BAS
- Full Integration with Aurora Controls Network
- Hot gas modulating reheat with head pressure control
- Preheat output signal with configurable outdoor air temperature limits
- Economizer operation with factory installed outdoor air and exhaust air bypass dampers.
- Intelligent sensors at each station on the air-to-air energy recovery device.
- CFM control
- Advanced Dehumidification
- Multi-Zone VAV
- Single Zone VAV
- CAV
- Demand controlled ventilation
- Drybulb/Enthalpy controlled economizer operation
- Supply Air Temperature Reset
- Remote Supply Air Temperature Reset
- Aurora DOAS Controller Secondary Operation
- Building Pressure Control
- BACnet MS/TP and IP capable
- Network controlled CFM

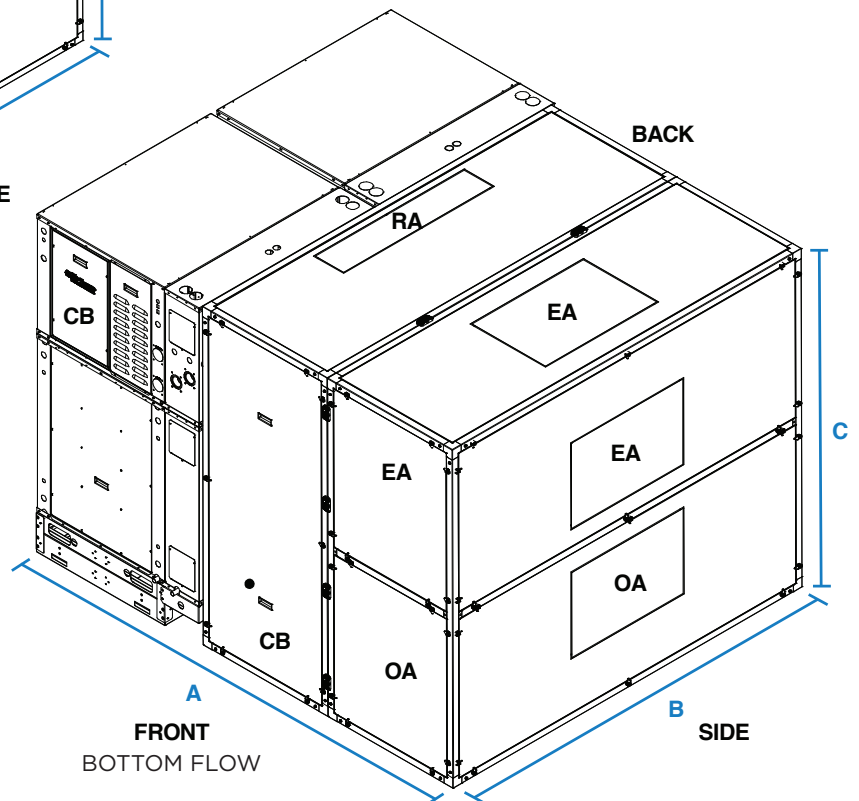
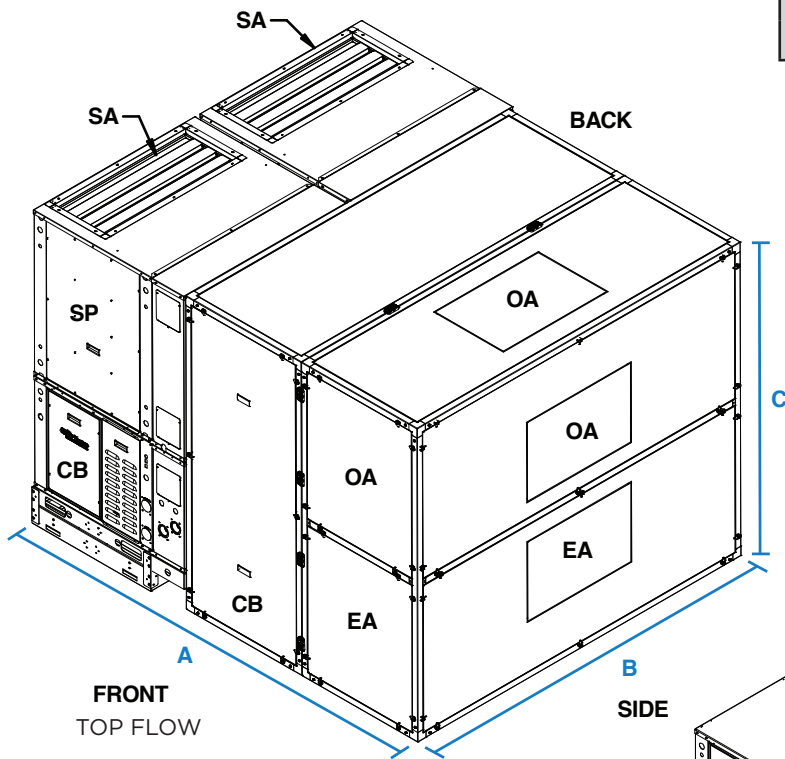


DIMENSIONAL DATA

Model	A	B	C	Airflow Range (cfm)
DAS120S1	109.6 [2783]	59.6 [1513]	77.7 [1973]	2,000-5,000
DAS180S1	109.6 [2783]	59.6 [1513]	77.7 [1973]	2,000-5,000
DAS240L2	109.6 [2783]	92.6 [2352]	77.7 [1973]	5,000-8,000
DAS360L2	109.6 [2783]	92.6 [2352]	77.7 [1973]	5,000-8,000

Available Inlet/Outlet Configurations						
DOAS Configuration	Inlet/Outlet	Top	Bottom	Side	Back	Front
Top Flow	OA Inlet	x		x	x	x
	SA Outlet	x		x		
	RA Inlet		x		x	
	EA Outlet		x	x	x	x
Bottom Flow	OA Inlet		x	x		
	SA Outlet		x	x		
	RA Inlet	x			x	
	EA Outlet	x		x	x	x

STANDARD DIMENSIONS IN INCHES (MM)



WHY WATERFURNACE

WaterFurnace International's corporate headquarters and ISO 9001:2015 certified manufacturing facility are both located in Fort Wayne, IN.. As a pioneer, and now a leader in the industry, the team at WaterFurnace is dedicated to providing the finest comfort systems available.

All units are computer run-tested, with conditioned source water, in all modes to ensure efficiency and reliability

- Tax Credits for your DOAS system
- Single supplier
- Pair with our Variable Speed units
- Tech Service
- Warranty
- Accurately predict lead time using selection software that runs in real-time
- All units are designed, maintained, and built by our industry-leading team in a ISO 9001:2015 certified manufacturing facility located in Fort Wayne, IN



WeDoGeo

- All refrigerant brazing is performed in a nitrogen atmosphere
- All units are deep evacuated to less than 150 microns prior to refrigerant charging
- All joints are helium leak-tested to ensure an annual leak rate of less than 1/4 ounce
- All major components bar coded; eliminating possibility of mismatched parts built into unit
- All units have model number and serial number embedded in control for local or remote retrieval
- WaterFurnace International, Inc. is an ISO 9001:2015 certified manufacturing facility
- WaterFurnace International engineering labs are ISO 17025 accredited

A Versatec DOAS unit connected to a ground loop qualifies the entire system for the federal tax credit. Ask your WaterFurnace contact for more information.



SB2701EW

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Product:

Versatec DOAS



WaterFurnace HVAC Systems
Built in the U.S.A