
OXYGEN8
VENTUM+
High Performance H/ERV with
Hydronic / VRV Integration

Who We Are

Oxygen8 is reinventing how buildings provide healthy and comfortable air in an energy efficient way. We work to enhance living and working environments with 100% fresh, filtered air using smart technology for maximum comfort and value.

[ox·y·gen·ate]

Nothing is more refreshing and essential to the human body than oxygen, which happens to be the eighth element in the periodic table. We oxygenate businesses, classrooms, senior care facilities and other buildings with 100% fresh air so people can work, live and breathe in a safe and comfortable environment.

Why We Do What We Do

To Create Healthy Indoor Environments

People are getting sick while working in offices, learning in classrooms and convalescing in senior care facilities. Traditional centralized HVAC systems that recirculate air without proper filtration and humidity control are the root cause of poor IAQ. To prevent the transmission of bacteria and viruses, new HVAC systems must provide dedicated outdoor air and eliminate recirculation, have small zoned ventilation systems, include MERV filters, control humidity levels and used fixed-plate ERV technology that eliminates contaminant cross-over between outside and exhaust streams.

To Move Toward Building Electrification

To reduce greenhouse gases, many North American cities are moving toward net-zero energy buildings over the next decade, which will drive demand for all-electric HVAC systems and low energy technologies. We are here to meet that demand with our all-electric heating and cooling heat-pump integration solutions.

For Better Building Design

Super-insulated buildings significantly reduce heating requirements, while climate change and developers' desires for large amounts of glazing will increase cooling needs. The integration of VRV with ERV helps to reduce energy consumption and meet ventilation requirements.

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VENTUM+ H/ERV
High Performance
Counter-flow Heat Exchanger

Energy Efficient

Ventum+ features variable speed plenum ECM direct-driven fans with low energy consumption and insulated panels for a high-efficiency solution. The counter-flow core allows for high sensible (HRV) and latent (ERV) energy recovery with no moving parts or cross contamination.

Healthy Buildings

Ventum+ uses 100% outside air, with an option in the future for recirculation. The counterflow ERV core is made of a polymer membrane with no virus cross-over: tested under ASTM F1671. The units ship with MERV 13 filters for outdoor air and MERV 8 filters for return air.

All-Electric

This all-electric ventilation solution helps to reduce the carbon footprint of buildings, while bringing 100% fresh outside air into the space. Ventum+ integrates with Daikin's VRV Outdoor Unit for temperature and humidity control all year round. Ventum+ integrates with heat-pump chillers using hydronic coils and valves

Modular Design with Wide Airflow Range

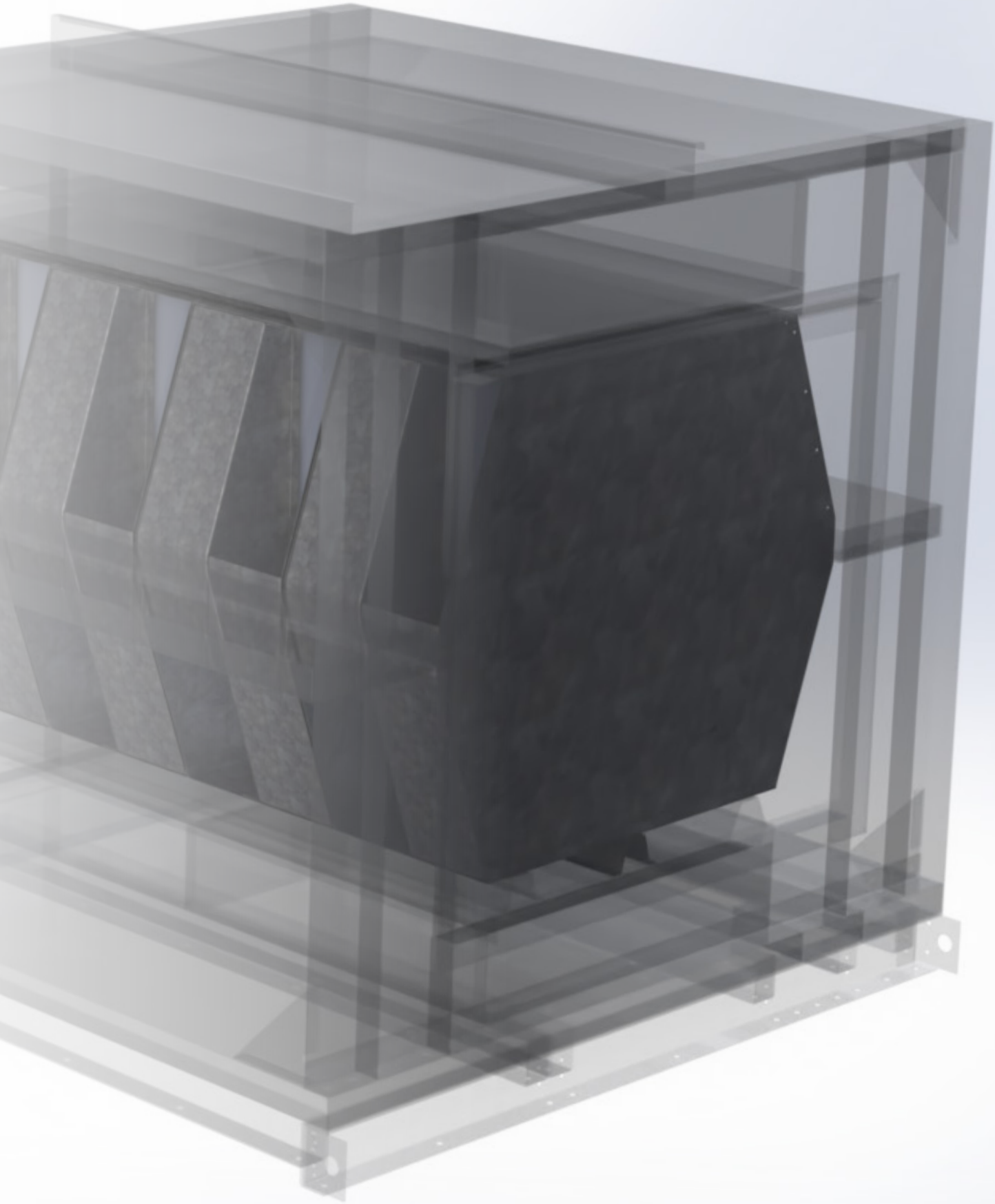
Ventum+ units have a 1,200 – 10,000 cfm range. The units are shipped in smaller modules for indoor installations and can also be mounted on rooftops with horizontal or down discharge.

Integrated Solution

Ventum+ integrates with Daikin's VRV Outdoor Unit and W or D-Controller which comes factory-mounted to the Daikin approved DX Coil and Electronic Expansion Valves.

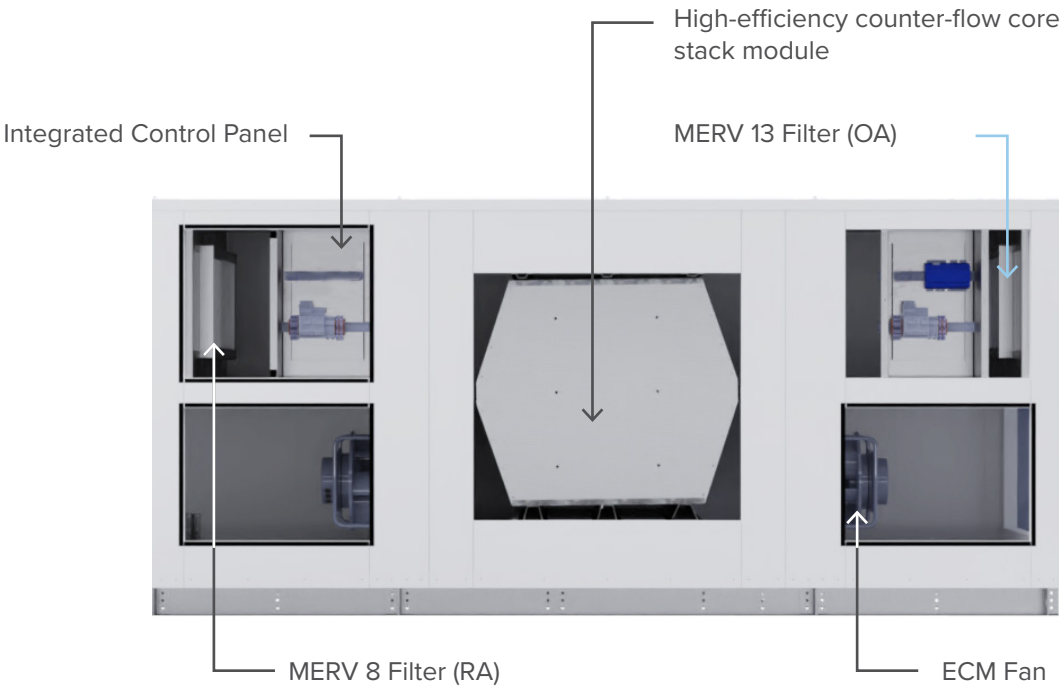
Accurate Temperature & Humidity Control

With Daikin VRV heat recovery systems both leaving air temperature and humidity can be controlled accurately.



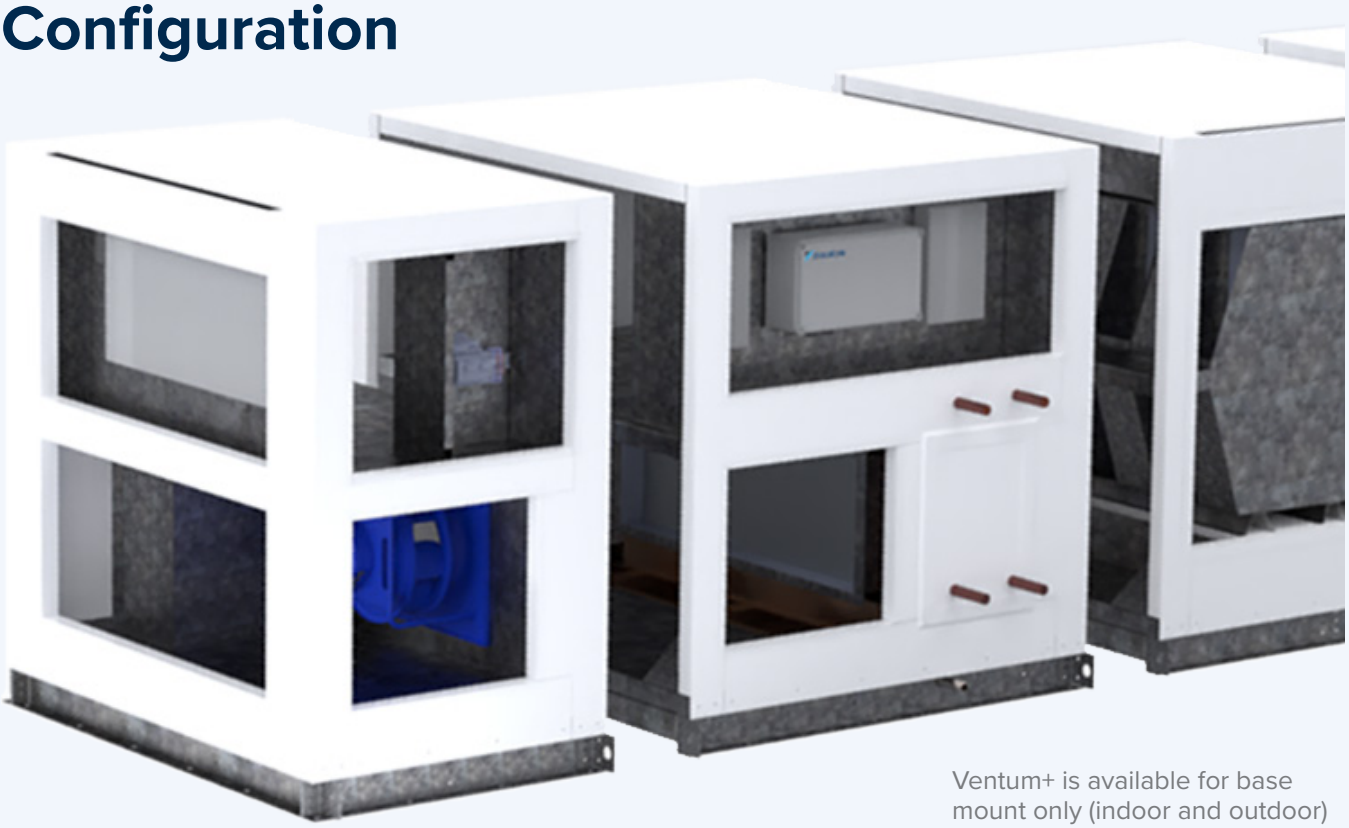
Ventum+ System Overview
Base System Components

Indoor Base Model

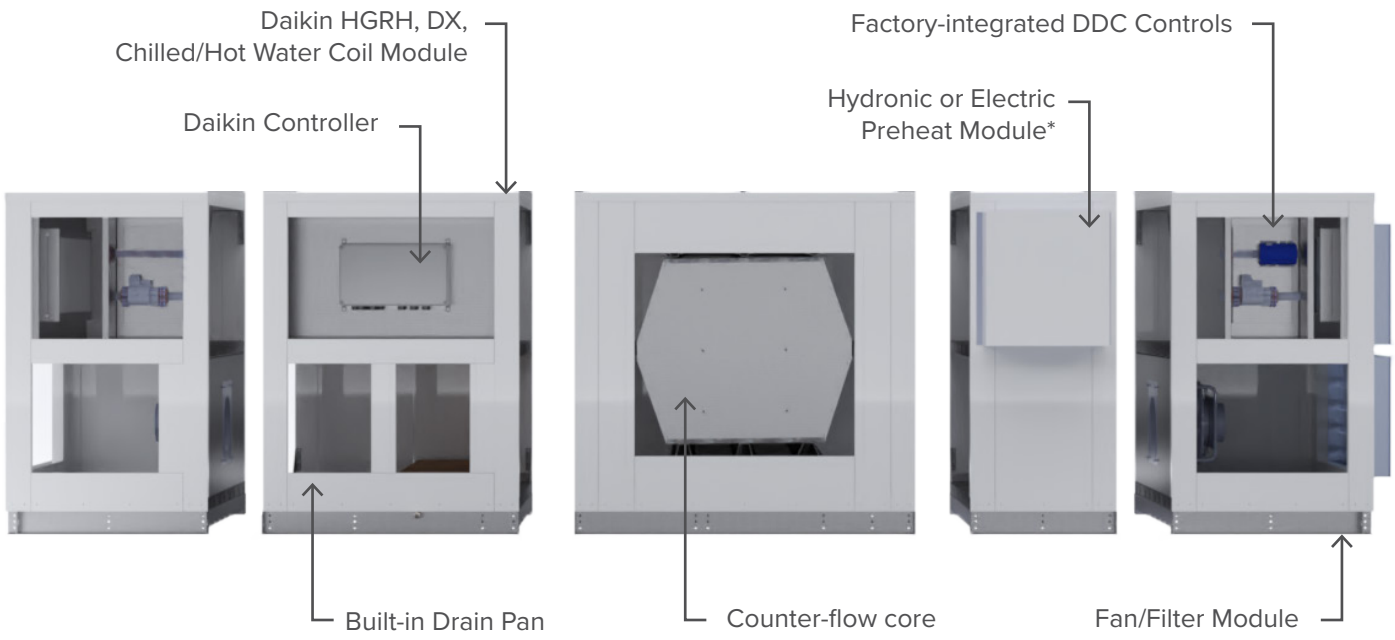


Outdoor Base Model with Optional Downshot Module

Mounting & Configuration



Ventum+ is available for base mount only (indoor and outdoor)



*An electric post-heat option also is available, similar to the pre-heat module shown, but placed between the SA fan and VRV modules

Model Sizing

Model	Airflow Range	Dimensions	Module Length**		Optional Module Length		
	cfm	(L x W x H*) in.	Core (in)	Fan-Filter (in)	DX/DH-RH Coil (in)	Electric Heater (in)	Downshot (in)
V20	1,200 - 1,800	122 x 56.6 x 56	56	33	42	24	40
V25	1,800 - 2,400	117.5 x 56.6 x 62	51.5	33	42	24	40
V30	2,400 - 3,200	117.5 x 69.8 x 66	51.5	33	42	24	40
V40	3,200 - 4,000	122 x 69.8 x 74	56	33	42	24	40
V50	4,000 - 4,800	131 x 69.8 x 84	65	33	42	24	40
V60	4,800 - 6,400	131 x 85.9 x 86	65	33	48	36	40
V80	6,400 - 8,000	138.5 x 85.9 x 100	72.5	33	48	36	44
V100	8,000 - 10,000	138.5 x 102.1 x 100	72.5	33	48	36	44

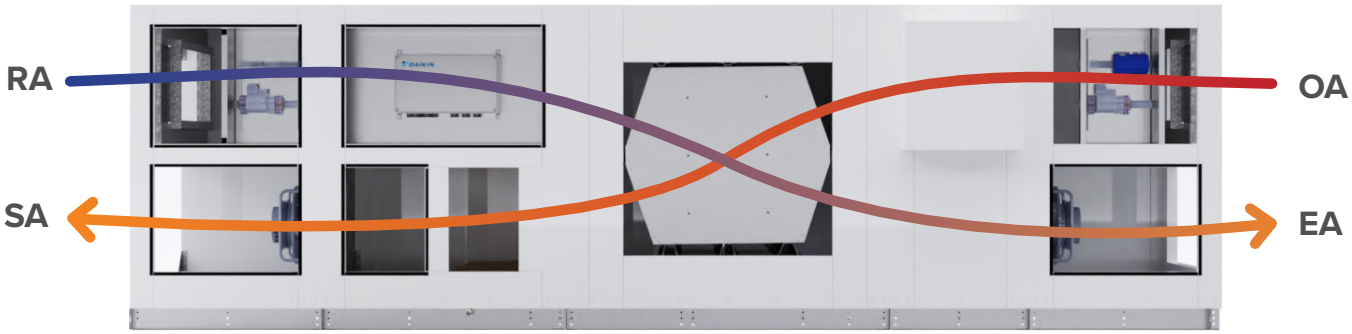
*Height excludes 2-inch standing seams on the roof of rooftop units.
**One core module and 2 fan-filter modules are included in the base unit design.

Performance

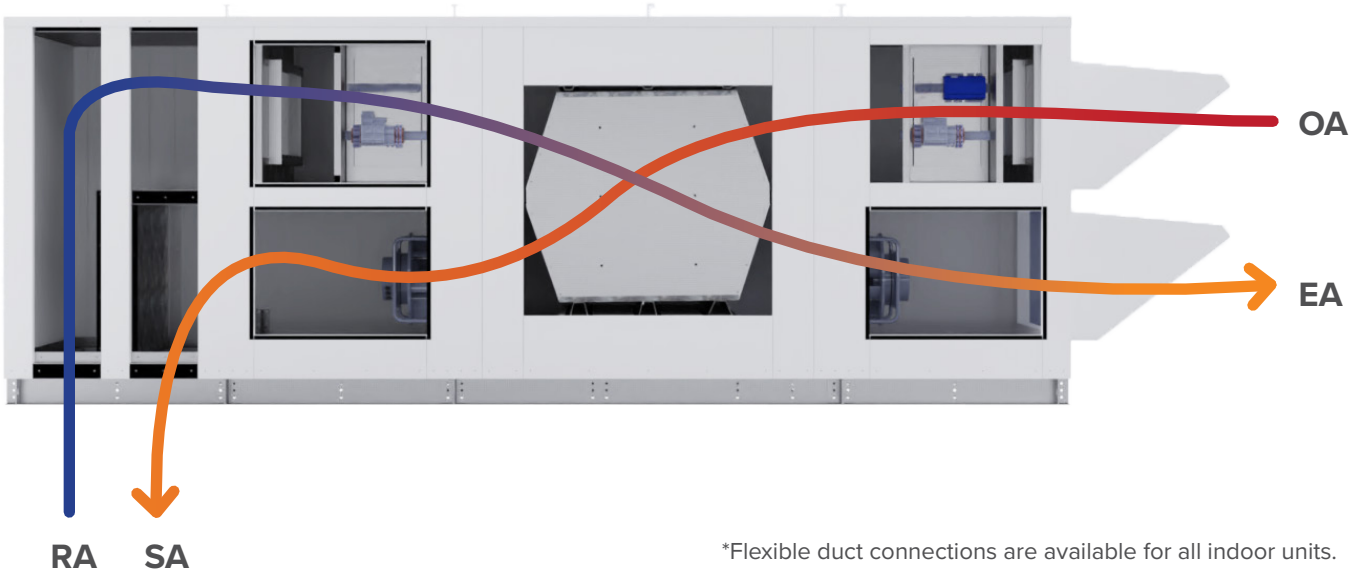
Model	Max Airflow	ERV With Bypass			ERV No Bypass			HRV with Bypass	HRV No Bypass
	cfm	SRE	LRE	TRE	SRE	LRE	TRE	SRE	SRE
V20	1,800	72.5	57.4	63.2	75.7	63.3	68.0	82.5	81.1
V25	2,400	72.5	57.4	63.2	75.7	63.3	68.0	82.5	81.1
V30	3,200	72.5	57.4	63.2	75.7	63.3	68.0	82.2	81.1
V40	4,000	72.5	57.4	63.2	75.7	63.3	68.0	82.2	81.1
V50	4,800	72.7	58.4	63.9	75.8	63.9	68.5	81.4	72.7
V60	6,400	72.7	58.4	63.9	75.1	62.6	67.4	81	72.7
V80	8,000	72.7	58.4	63.9	75.1	62.6	67.4	81	72.7
V100	10,000	72.7	58.4	63.9	74.8	62	66.9	80.7	72.7

Airflow and Energy Recovery Technology

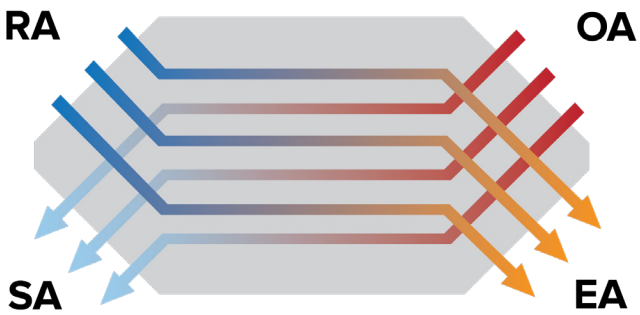
Ventum+ Indoor*



Ventum+ Outdoor with Downshot Module



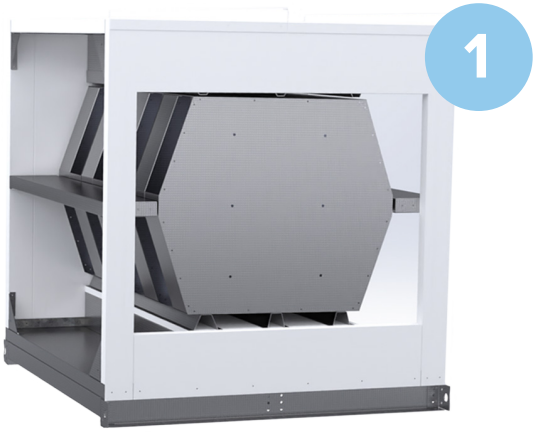
*Flexible duct connections are available for all indoor units.



Counter-Flow Heat Exchanger

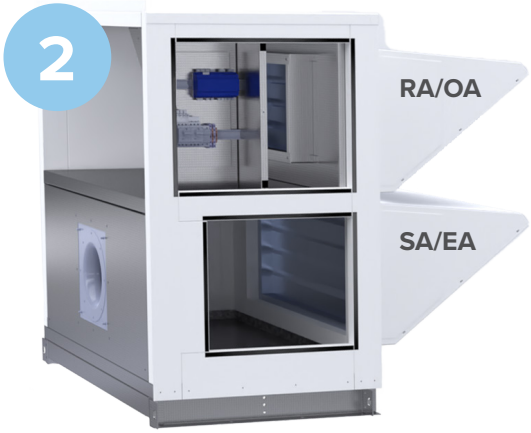
Heat recovery counter-flow heat exchangers (HRV) provide up to 90% sensible effectiveness, while energy recovery counter-flow heat exchangers (ERV) provide up to 80% sensible and 70% latent effectiveness. Fixed-plate cores have no moving parts and require little to no maintenance. Due to the structure of the core, return and outdoor air never mix, eliminating the possibility of virus and contaminant crossover.

Modules & Accessories



Core Module

Ventum+ features stacked counterflow HRV or ERV cores. A stainless steel drain pan is included for HRV options.



Fan and Filter Module

The factory-integrated DDC controls are packaged into the upper filter sections, and ECM fans are mounted below. There are two fan/filter modules per unit. Hoods are only included on outdoor EA/OA modules.

VRV Module

The heating and cooling coil section is available in DX, Hot Gas Reheat. Integrated VRV controllers and valve kits are factory wired and powered by the unit.

Hydronic Conditioning / Dehumidification Module

Hydronic chilled water coil and optional hot water reheat coil are packaged in a single module with cabinet space where hydronic valves can be mounted in the field.

Hydronic Heating Module

Hydronic pre-heat and post-heat module.

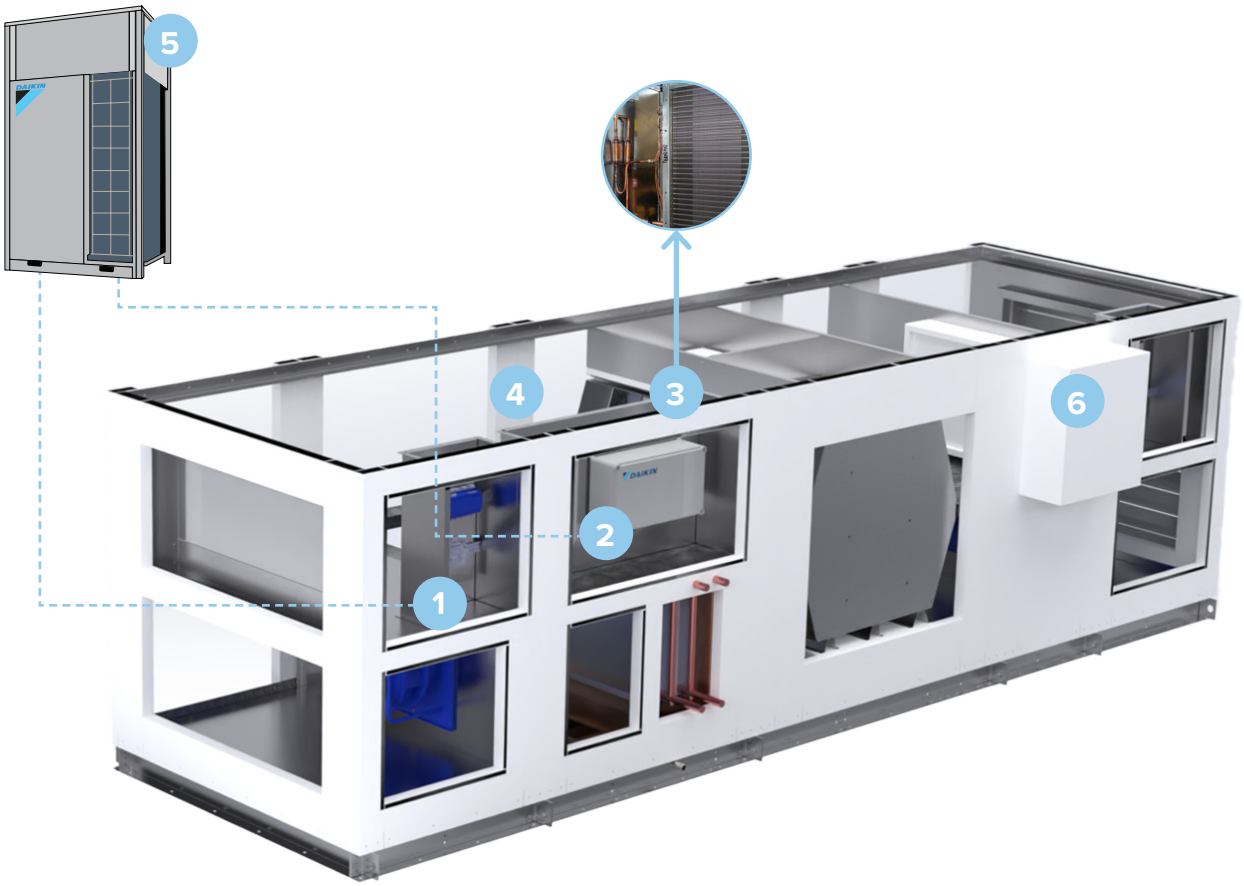
Electric Heating Module

Electric pre-heat and post-heat module.

Downshot Module

Supply and/or return air streams available through field-supplied roof curb.

Daikin VRV Integration



1. **Ventum+ Integrated Controls**
   Ventum+ features a factory-mounted and tested integrated control system that communicates with Daikin VRV technology. The controller is BTL-Certified with BACnet IP compatibility.

2. **Daikin W-Controller or D-Controller**
   Factory-mounted to a coupled DX or HGRH coil section, the controller communicates with the Daikin VRV Outdoor Unit, Electronic Expansion Valve Kit and Ventum+ controls for accurate temperature and humidity control.

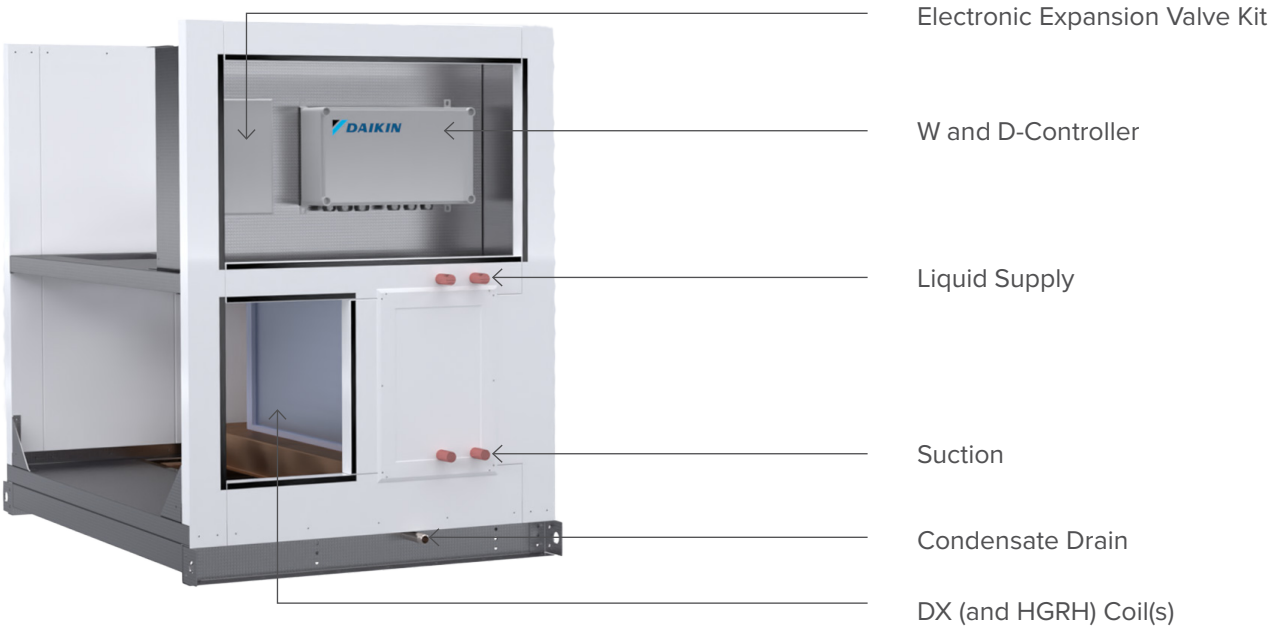
3. **Daikin Electronic Expansion Valve**
   The electronic expansion valve is modulated by Ventum+ controls to maintain the setpoint. The expansion valve is factory mounted to the DX or HGRH coil.

4. **DX or Hot Gas Reheat Coil**
   Coils are selected based on Daikin coil selection parameters (3 ton min. cooling). They are factory-mounted into the coupled coil section. Coil section includes a stainless steel double sloped drain pan. Optional electric and hydronic reheat is available.

5. **Daikin VRV Outdoor Unit**
   Daikin's inverter based outdoor unit for either heating or cooling (heat pump) operations. Available with air or water source options.

6. **Optional Pre-heat**
   Pre-heat can be hydronic (glycol) or electric. Pre-heat only activates when the outdoor air temperature is below the setpoint.

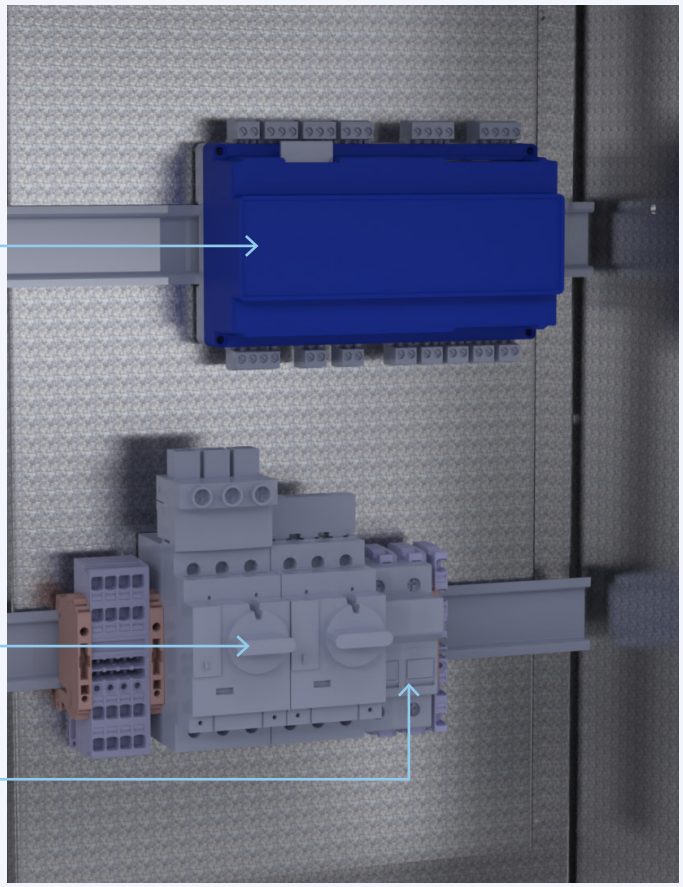
Heating and Cooling Module



VRV Capacities

Model	Max Airflow cfm	DX Only Tonnage Sizes	Hot Gas Reheat Tonnage Sizes	
			DX Coil (min 3T)	Reheat Coil (min 1.5T)
V20	1,800	3T, 4T, 5T, 6T	5T, 6T	2.5T
V25	2,400	3T, 4T, 5T, 6T, 8T	6T, 8T	3T
V30	3,200	4T, 5T, 6T, 8T, 12T	8T, 10T, 12T	4T
V40	4,000	5T, 6T, 8T, 12T	10T, 12T	5T
V50	4,800	6T, 8T, 12T, 16T	12T, 16T	6T
V60	6,400	6T, 8T, 12T, 16T, 24T	16T, 18T, 24T	7.5T, 8T
V80	8,000	12T, 16T, 24T	18T, 24T, 32T	9T, 10T
V100	10,000	12T, 16T, 24T, 32T	24T, 32T	12T

Integrated Controls



Standard Sensors

1 **Dual Differential Pressure — Huba 699M**

Differential Pressure for Fans and Filters

2 **Supply Air Temperature and Relative Humidity — Siemens QFM2150/MO**

Used to control post-heat, cooling, DX coil and HGRH

For all optional IAQ sensors, please reference Oxygen8's Controls Brochure, or contact your local Sales Rep.

Smart Controls

Standard Control Algorithms

1. Airflow Control

Constant Flow
Constant Pressure
Demand Controlled Ventilation
(CO_2/VOC, Occupancy)

2. Temperature Control

Constant Supply Air or Return Air Temperature
Cooling and Heating

3. Humidity Control

Humidification (3rd party)
Dehumidification (HGRH)

4. Defrost Control

Measuring Pressure Drop Across Heat Exchanger
Exhaust Air Temperature
Timed Exhaust

5. Frost Prevention

Electric Pre-Heat
Hydronic Pre-Heat

6. Remote Access

Via Building Network
Via BACnet IP

IAQ Monitoring

Stay connected with cloud-based indoor air quality management.

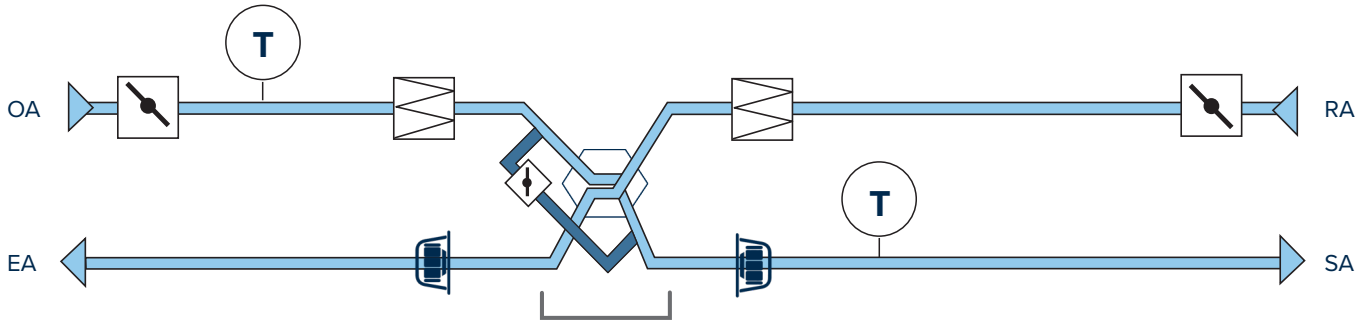
Cloud-based IAQ management allows for optimal monitoring and control of dedicated outside air systems, without a traditional building automation system. Accessible via web or mobile, cloud-based IAQ management is suitable for most building types.

Remotely manage equipment with smart device sensors, enable alerts, alarms, and notifications for specific trends or issues, while gaining insight into how equipment is performing.

Learn More Contact your local Oxygen8 Sales Rep.

Common Control Strategies

Economizer / Free Cooling



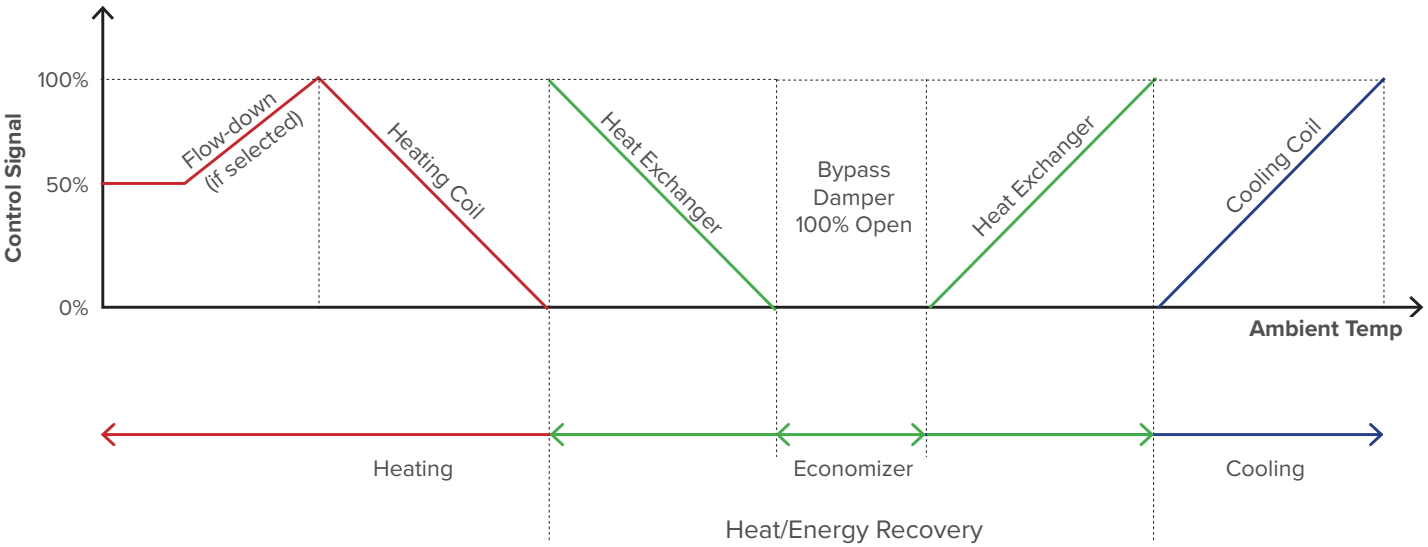
Filter
Fan
Damper
Electric Heating Coil
Pressure Sensor
Temperature Sensor
Counter-flow Heat Exchanger
Drain Pan
Hydronic Heating Coil
Hydronic Cooling Coil
Combo Heat/Cool Coil

The Ventum+ unit controller takes advantage of the economizer option to provide “free” cooling (or heating) by bypassing outdoor air around the core and directly supplying air into the building when conditions allow.

The control algorithm constantly monitors the outdoor and return air temperatures, while modulating the bypass damper based on the supply air setpoint.

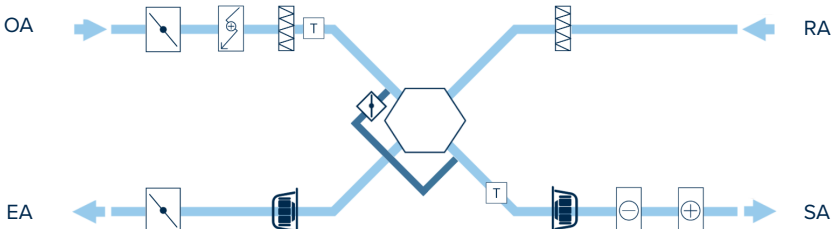
By default, the bypass will be controlled to 100% sensible recovery position when a cooling cycle is starting. If the outdoor air temperature raises to a value higher than the supply air temperature or room air temperature, then the cooling coil will be activated.

If the flow-down step function is activated (triggers during heating mode) and the setpoint cannot be reached with all heating sources active, the unit will decrease the flow down to 50% of the rated flow to attempt to achieve the desired setpoint



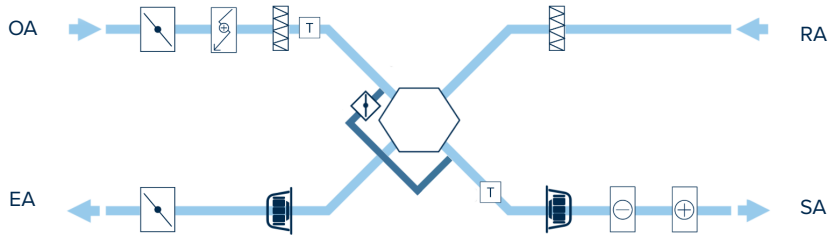
Frost Prevention

Electric Pre-Heat



An electric pre-heat coil ensures that the temperature entering the heat exchanger is maintained at a required minimum temperature. The pre-heat temperature sensor will come installed in the unit, positioned in the outdoor air stream. Preheat is controlled by the unit, has integrated SCR control and is fully modulating.

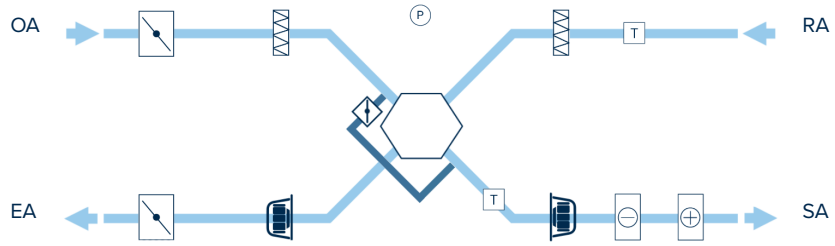
Hydronic Pre-Heat



A hydronic pre-heat coil ensures that the temperature entering the heat exchanger is maintained at a required minimum temperature. If the maximum heat supply from the pre-heat coil cannot maintain the setpoint, a frost alarm will be activated and the fans and valves will be stopped.

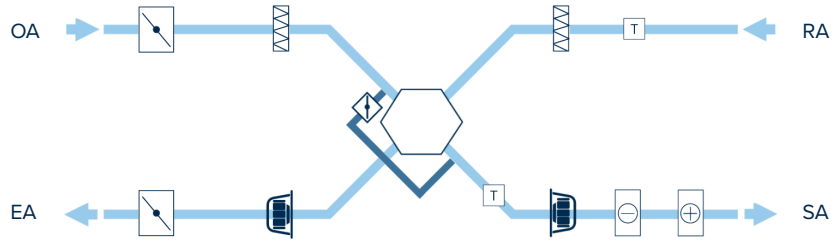
Defrost Strategy

Monitor Pressure Drop Across the Heat Exchanger



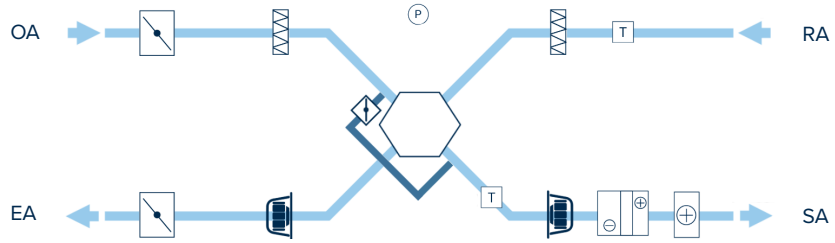
The heat exchanger can be protected against frosting by continuously monitoring the pressure drop (PD) across the heat exchanger. Defrost will start when the PD rises above the setpoint. During defrost the bypass damper will open 100% for a specified period of time.

Monitor the Exhaust Air Temperature



At temperatures below set value for the exhaust air temperature, the bypass damper will open to 100%. The outdoor air passes around the heat exchanger and the return air passes through the heat exchanger. Due to the relatively high room temperature, this function will lead to the thawing of the frost formation on the heat exchanger.

Timed Exhaust



When frost formation is detected the supply fan ceases operation for 5* minutes (*adjustable), while the exhaust fan continues to operate and thaw the ice accumulation on the heat exchanger. After 5 minutes, the supply fan will resume normal operation until frost is accumulated again. This cycle repeats itself until minimum normal operating cycle time, 30* minutes (*adjustable).

Electrical

Model	Airflow	Nom. V (3-Ph)	Motor (kW)	SA Fan Qty	RA Fan Qty	Unit FLA	MCA	MOP/RFS
V20	1800	208	2	1	1	12.33	13.83	15A
V20	1800	460	2.5	1	1	8.14	9.14	15A
V25	2400	208	2.7	1	1	17.53	19.68	25A
V25	2400	460	3.7	1	1	11.74	13.19	15A
V30	3200	208	3	1	1	18.33	20.58	25A
V30	3200	460	3.3	1	1	10.94	12.29	15A
V40	4000	208	2.7	2	2	24.33	25.83	30A
V40	4000	460	2.5	2	2	16.14	17.14	20A
V50	4800	208	2.7	2	2	34.73	36.88	45A
V50	4800	460	3.7	2	2	23.34	24.79	30A
V60	6000	208	3	2	2	36.33	38.58	45A
V60	6000	460	3.3	2	2	21.74	23.09	25A
V80	8000	208	2.7	3	3	51.93	54.08	60A
V80	8000	460	3.7	3	3	34.94	36.39	40A
V100	10000	208	3	3	3	54.33	56.58	60A
V100	10000	460	3.3	3	3	32.54	33.89	35A

RA Return Air
SA Supply Air
MCA Minimum Circuit Ampacity
MOP/RFS Maximum Over Current Protective Deviec / Recommended Fuse Size
Data is relevant for H/ERV-only units. For electrical data involing single-point power electric heaters, please refer to the project-specific submittal.

Specifications

1 System Overview

Oxygen8's Ventum+ series is a modular design with a base H/ERV unit and optional coil modules for heating, cooling and Daikin VRV integration.

2 Standard Features

- ☐ High-Efficiency Variable Speed EC Direct-Drive Motor
- ☐ Plenum Backward Inclined Fans
- ☐ Factory-Mounted Shut-off Dampers (Standard for Outdoor Applications, available as optional for indoor applications)
- ☐ 4 Standard Temperature Sensors (OA, RA, EA, SA)
- ☐ Integrated Controls with BACnet IP and BTL-Certification
- ☐ Non-Fused Disconnect Switch
- ☐ 2" Foam-Injected Double-Wall Panels (6.5) -ERD
- ☐ Pre-Painted White Exterior Casing
- ☐ Galvanized Steel Panels
- ☐ 12-Ga Galvanized Steel Base Frame (24 Ga doors, 18 Ga structural posts, 18 Ga internal wall panels, 24 Ga external wall panels)
- ☐ Filter Alarms: Signaled by factory-mounted pressure gauges to measure filter pressure drop across filter
- ☐ 4" Pleated MERV 13 Outdoor Air Filter
  4" MERV 8 Return Air Filter

3

- ☐ DAT Sensor for Temperature and Dehumidification Control
- ☐ Hydronic 2/3-Way Valves and Actuators for Field Installation

4

- ☐ Internally-located Control Panels

Electric Coil Specifications

- ☐ SCR Controlled
- ☐ Non-Fused Disconnect Switch
- ☐ Single-Point Power Connection (with limitations)

Installation Options

5

- ☐ Indoor or Outdoor
- ☐ Indoor: Floor-Mounted, Horizontal Airflow
- ☐ Outdoor: Curb-Mounted, Horizontal or Downshot
- ☐ Orientation: Right Hand or Left Hand
- ☐ Access Options: Front Doors

6 Warranty

- ☐ 24 Months from Shipment

VRV Integration

- ☐ Factory Mounted DX Coils and Factory-Brazed Expansion Valve kit to the Coil

7

- ☐ Factory Mounted Hot Gas Reheat Coils and Factory-Brazed Expansion Valve kit to the Coil
- ☐ Factory Mounted and Wired W- or D-Controller

Options

- ☐ Integrated Bypass for Economizer and/or Defrost Strategy
- ☐ Extended Warranty
- ☐ Optional Sensors: CO_2/VOC, Humidity, Pressure
- ☐ Virtual Start-Up Appointment

FAQ

What material is the Oxygen8 casing made of?
Painted 22-gauge steel panel exterior with galvanized interior.

Who manufactures the ECM fans?
Ziehl Abegg or EBM Papst.

Does the W-Controller require a separate power supply and what is the amp draw?
Yes, a 230V/1ph power supply, 15A.

Do you offer non-fused disconnect?
Yes, it is standard. We use a switch disconnect with internal breakers.

Is the damper powered by the unit?
Yes.

How are the dampers controlled?
Damper control is automatic based on the operation of the unit. The Ventum BTL-Certified BACnet controller will provide an on/off output signal to the dampers. Dampers are factory-installed and wired.

Is a filter sensor provided with the unit?
Yes. Dirty filter gauges are standard - an alert will be sent when filters need to be changed.

Is your controller standard on all units, and native BACnet IP, or do we need to add a card?
Yes, integrated, programmable controls come standard with every unit. They are BTL-Certified for BACnet IP. The card is native BACnet IP.

Are your controls MSTP compatible?
Yes, but a gateway would be required by the controls contractor.

How is the Daikin VRV controlled without Hot Gas Reheat?
The preferred operation is through the W-Controller with a 0-10v signal from the Oxygen8 controller (standard). Oxygen8 provides a DAT sensor downstream of the coils to control leaving air temperature when controller is provided

How is the Daikin VRV controlled with Hot Gas Reheat?
The preferred operation is through the D-Controller via Modbus from the Oxygen8 controller (standard). Oxygen8 provides a DAT sensor downstream of the coils to control leaving air temperature when controller is provided.

What sensors come integral to the unit?
There are 4 internal temperature sensors for the unit and 1 for the electric pre-heat that are included.

Do Ventum+ units require a drain connection?
Models with a cooling coil and HRV core come with a drain pan and require a drain connection. ERV units do not require a drain connection.

When is a drain connection required for bypass?
Anytime bypass is being used for defrost control a drain connection is required.

Notes

Notes

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OXYGEN8