Heat Recovery Ventilator

Model PVe

• Light Industrial • Commercial • Institutional

- 1,000 - 6,000 cfm
- 2.0 in. wg External Static Pressure
- Aluminum Plate Heat Exchanger

GREENHECK

Building Value in Air.

April
2017

Heat Recovery Ventilators

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Greenheck's model PVe is a sensible idea for your fresh outdoor air needs. This aluminum plate air-to-air heat recovery unit transfers sensible (heat) energy from the exhaust airstream to the supply airstream. This provides pretempered fresh outdoor air to the building, allowing you to reduce the size of your heating and cooling equipment, resulting in lower utility bills year round.

Light industrial applications, as well as bathroom and locker room exhaust, are great places to use Greenheck's model PVe. Typical heat recovery ventilator applications are listed below.

Locker Rooms	Schools	Casinos	Dormitories
Animal Shelters	Bars and Clubs	Office Buildings	Printing Shops
Maintenance Shops	Nursing Homes	Auto Repair Buildings	Veterinary Hospitals

Features	Benefits
Industry Leading Selection Software (CAPS)	Greenheck's Computer Aided Product Selection (CAPS) software reduces design time by quickly analyzing system design parameters and providing a list of units to minimize cost and optimize performance. The program outputs fan, electrical, and plate heat exchanger data, as well as configuration-specific 2-D and 3-D Revit drawings for easy implementation into building schedules and plans.
Compliance with Industry Standards	ASHRAE standards and energy codes have a mandated enthalpy recovery ratio of 50% or greater. Greenheck's CAPS program can help you select a compliant unit that has verified performance data by AHRI. Code officials and building owners recognize the benefits of utilizing energy recovery in applications with large amounts of ventilation air and Greenheck can help provide the best unit.
Maintenance/ Serviceability	Greenheck's heat recovery ventilators have been designed to allow easy access to filters, blower assemblies and plate heat exchanger. As reassurance to the customer, each unit carries a one year warranty.
System Efficiency/ Payback	The incorporation of heat recovery allows for equipment downsizing as well as continued lower energy costs throughout the life of the equipment. This downsizing moderates the variability of loads on the system, increasing the efficiency of furnaces, electric heaters, DX coils and water systems.

Product Certifications

Greenheck takes pride in offering a high quality, reliable product. We invest our resources into designing, testing and manufacturing products to ensure customer satisfaction.

ETL Listed for electrical and overall unit safety. Every unit is tested at the factory before it is shipped to the jobsite.

Energy recovery wheels are certified by the AHRI Air-to-Air Energy Recovery Ventilation Equipment Certification Program in accordance with AHRI Standard 1060. Actual performance in packaged equipment may vary. Certified ratings are available in the Certified Product Directory at ahridirectory.org.

Standard Operation and Unit Controls

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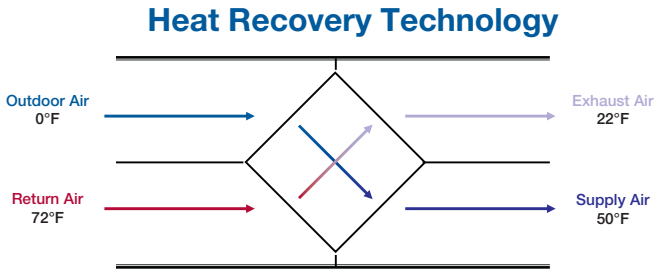
How does the plate heat exchanger work?

Improving building indoor air quality requires fresh outdoor air be provided to the building. A heat recovery ventilator combines both airstreams into one unit and transfers energy between the airstreams while keeping the air separated. This unit reduces energy consumption while meeting the ventilation requirements of your building.

Winter Operation

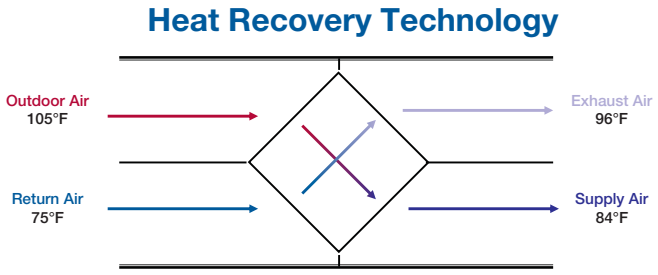
On cold winter days, the warm exhaust air (return air) from the building heats up the plate heat exchanger. Cold outdoor air hits the warm plate heat exchanger which heats the air entering the building with a sensible effectiveness of up to 70%. In this example, if the space temperature is 72°F during the winter, on a 0°F day, the air coming off of the plate heat exchanger (supply air) would be 50°F. The heating equipment now only needs to heat from 50 to 72°F, rather than 0 to 72°F saving significant amounts of energy all winter long.



PVe plate heat exchanger

Summer Operation

On hot summer days, the unit takes cool conditioned air from the space and passes it through the plate heat exchanger. Hot summer outdoor air hits the cool plate heat exchanger which cools the air entering the building with a sensible effectiveness of 70%. In this example, if your space is air-conditioned to 75°F during the summer, on a 105°F day, the air coming off of the plate heat exchanger (supply air) would be 84°F. The cooling equipment now only needs to cool from 84°F to 75°F saving significant energy throughout the summer.



PVe plate heat exchanger

Unit Controls

Remote Panel - With the optional remote panel, you have control and the information you want. Monitoring lights, on/off time-clock control, or on/off/auto switch are a few of the available options. So whether you want to control the unit operation via a 7-day time clock or simply want to monitor unit performance, the remote panel is the option that provides valuable information.

Network Interface - An optimum solution for connecting the unit to a Building Management System (BMS). The network interface offers an easy-to-use, remote-mounted display. It easily integrates to BACnet® IP, BACnet® MSTP, LonWorks® or Modbus®. Two operating options are available:

Monitor only: Allows the BMS to monitor the status and functions of the unit through a factory-installed controller. Control commands will be provided by terminal-style signals from a remote panel or external to the unit.

Monitor and Control: Allows the BMS to monitor the status and command the basic functions of the unit through a factory-installed controller. A remote panel is not available with this option.

Standard Features and Optional Accessories

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1 Weatherhood

- Downturn intake hood
- 2-inch aluminum mesh filters (mist eliminating)
- Exhaust hood with integral backdraft damper

2 Construction

- Double-wall construction with 1-inch insulation secured in place between solid inner and outer panels
- Insulation density of 1.5 lbs/cu. ft.
- Easy lift-off removable hinged access doors with stainless steel hinges and quarter-turn latches

3 Dampers

- Low-leakage, factory-mounted and wired insulated or non-insulated dampers

4 Frost Control

- Optional timed exhaust frost control cycles the blower on and off based on a factory-provided timer
- Optional face and bypass dampers allow air to bypass the plate heat exchanger when the temperature of the exhaust air leaving the exchanger drops below the adjustable setpoint allowing warm exhaust air to melt the frost

5 Filters

- 2-inch MERV 8 or MERV 13 outdoor or exhaust filters

6 Aluminum Heat Exchanger

- AHRI Standard 1060 Certified Performance
- High heat transfer up to 70% sensible effectiveness
- Corrosion-resistant

7 Integral Drain Pan

- Stainless steel
- Double-pitched for true condensate drainage

Standard Features and Optional Accessories

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8 Integral Base

- Solid base with half-inch upturned lips around bottom openings, perimeter and joints to prevent water from leaking through the base and into the building

S Standard Feature O Optional Feature

Optional Accessories

CO_2 Sensor - Engages the unit based on CO_2 levels, or it can increase or decrease airflow through the use of a VFD. Can be unit-mounted or space-mounted depending on your application.

Dirty Filter Sensor – Indicates when filters become dirty. An indicator light may be wall/beam mounted or provided with a remote control panel.

Exhaust Only Operation – Allows for the exhaust fan to run continuously while the fan in off.

Factory-Mounted Sensors - Amp draw, pressure or temperature sensors are available to monitor unit operation or to actively control the unit with controls by others.

Plate Economizer Control - Integral face and bypass dampers allow cool air to bypass the plate heat exchanger when it's in the free cooling range (temperature or enthalpy). When the conditions are too warm or cold, the dampers cycle back to allow heat recovery.

Service Receptacle – A 115 volt GFCI outlet is mounted externally in a NEMA-3R box for the convenience of service personnel. A separate 115 volt power source is required.

9 Exhaust and Supply Fan

- Double-width, double-inlet forward-curved wheels
- Neoprene isolation
- Optional factory-provided Variable Frequency Drive (VFD)

10 Control Center *(not shown)*

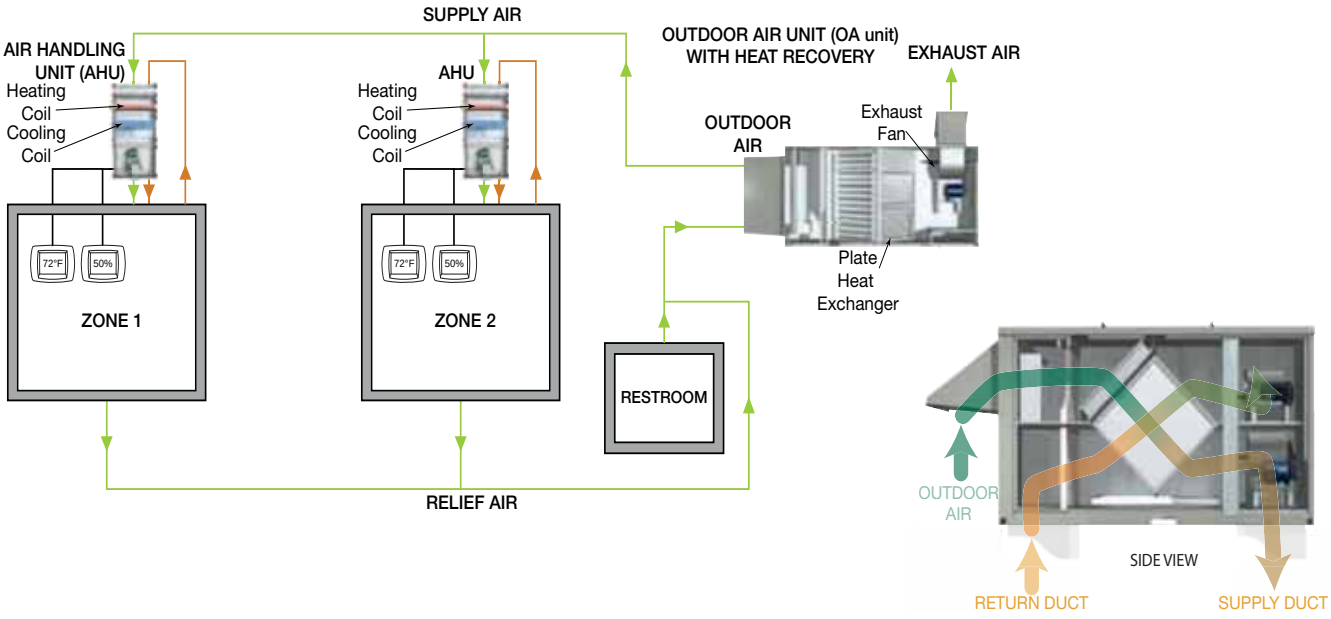
- 24 VAC control voltage
- Control transformer
- Disconnect switch
- UL Listed, Recognized or Classified electrical components
- Factory-wired for single point power connection

Typical Applications

The PVe unit can add to the benefit of a building design anywhere that outdoor air is required and the exhaust air is Class 3 or lower per standard ASHRAE 62-2016. Class 3 air is defined as significant contaminant concentration, significant sensory-irritation intensity, or offensive odors. With the aluminum plate heat exchanger's minimal cross-leakage design, Greenheck has targeted light industrial applications in addition to commercial and institutional comfort applications.

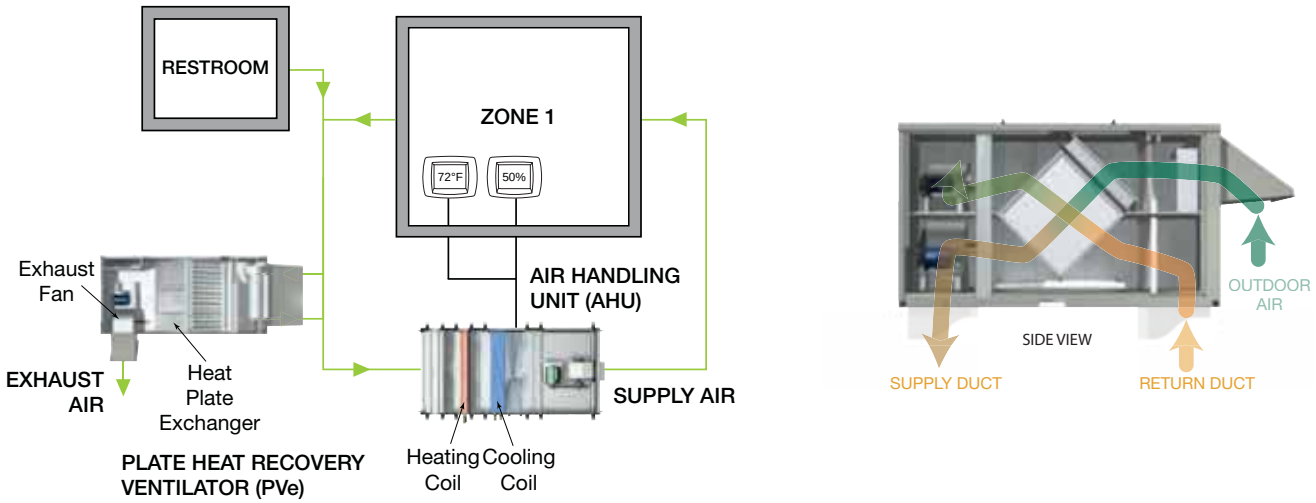
With Ducted Air Handlers

The PVe unit may be combined with ducted air handling units or fan coil boxes. A single heat recovery ventilator provides fresh outdoor air for multiple air handling units or in a one-to-one ratio where a single heat recovery ventilator and air handler serves only one space.



With Packaged Rooftop Equipment

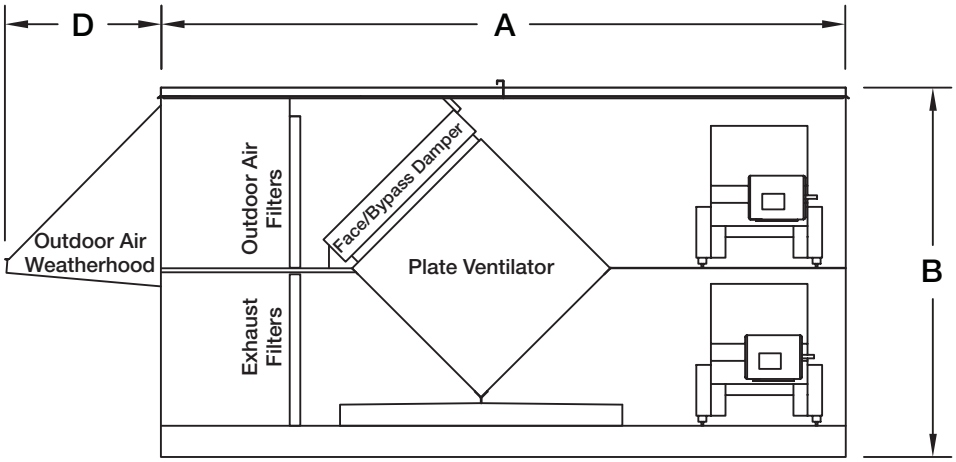
This diagram illustrates how heat recovery ventilators may be used in conjunction with packaged rooftop equipment. Fresh, outdoor air enters the heat recovery ventilator and is pretreated before entering the heating/cooling equipment. This pretreating occurs because the plate heat exchanger is transferring sensible energy between the outdoor air and the building exhaust air.

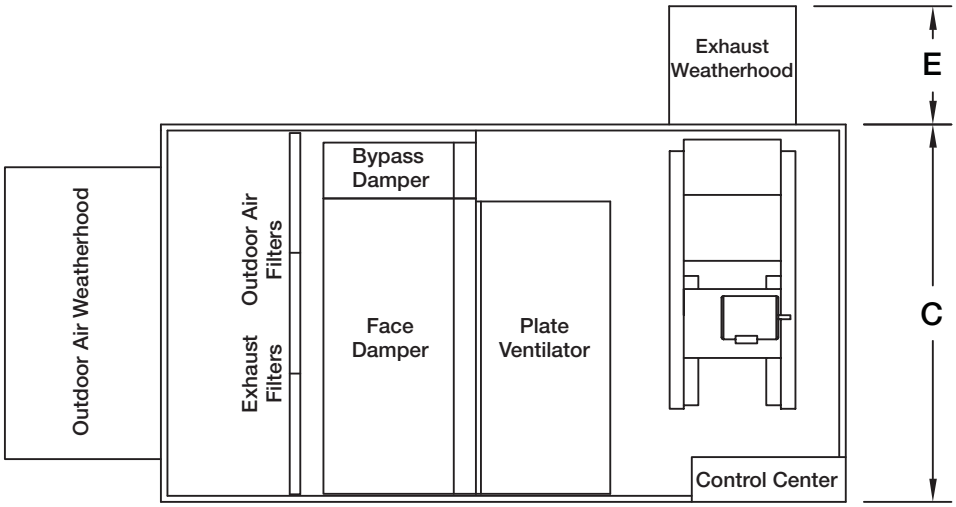


Dimensional Data

Model	A	B	C	D	E	Approx. Weight (lbs.)	Airflow Range (cfm)	Motor HP
PVe-20	104.1	59.7	41.5	20.3	20.7	1,300	1,000 - 2,200	1/4 - 2
PVe-35	104.1	59.7	49.2	25.2	17.7	1,600	2,200 - 3,400	1/2 - 3
PVe-45	110.6	59.7	61.1	25.2	19.0	2,100	3,400 - 4,500	1 - 5
PVe-55	116.5	59.7	76.1	25.2	23.8	2,700	4,500 - 6,000	1½ - 5

These weights include sheet metal weights added together with the largest motors, blowers and accessories for the units.





Available Intake/Discharge Positions				
Option	Bottom	Top	Side	End
Outdoor Air Intake				X
Supply Air Discharge	X		X	
Return Air Intake	X			
Exhaust Air Discharge			X	

Additional Energy Recovery Products

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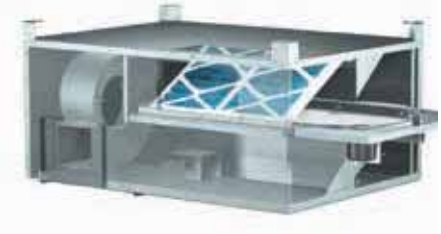
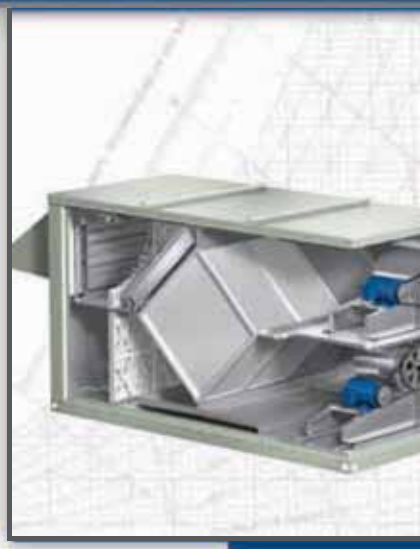


Model MiniVent

A low-profile preconditioner designed for compact indoor installations requiring 150 to 850 cfm and may be floor mounted or ceiling hung.



Model MiniCore

This preconditioner utilizes an energy recovery core for indoor installations ranging from 300 to 1,000 cfm. Designed to be mounted vertically or horizontally with optional intake and discharge connections configurable on site.

Model ERV

This reliable preconditioner provides total energy recovery primarily designed for indoor applications requiring 500 to 12,000 cfm.

Model ERVe

This preconditioner provides total energy recovery for outdoor applications requiring 1,000 to 6,000 cfm.

Model ERCH

This dedicated outdoor air unit combines the benefits of total energy recovery with supplemental heating and cooling in applications designed to supply 100% outdoor air. Airflow capacities range from 1,000 to 10,000 cfm.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

U.S. GREEN BUILDING COUNCIL MEMBER

Prepared to Support Green Building Efforts

Greenheck P.O. Box 410 • Schofield, WI 54476-0410 • Phone (715) 359-6171 • greenheck.com