

# Energy Recovery Laboratory Exhaust Model Vektor<sup>®</sup>-ERS

For Vektor-MD, MH and MS Systems



**VEKTOR<sup>®</sup>**



 **GREENHECK**  
Building Value in Air.

May  
2019

Greenheck's Vektor-ERS is a pre-engineered laboratory exhaust energy recovery system. In combination with our Vektor-M series blowers (Vektor-MD, -MH and -MS), this system is designed to effectively remove contaminated laboratory exhaust and disperse the exhaust high above the roof.

Vektor energy recovery exhaust systems utilize run-around coils to recover energy from the exhaust airstream and apply the energy to the make-up air system. Vektor-ERS offers a safe and efficient solution to eliminate the possibility of cross-contamination between exhaust and supply airstreams. Vektor-ERS run-around coil loops can achieve energy recovery efficiencies up to 55% to lower heating and cooling costs for the laboratory facility.

## Did you know...

- ▶ Laboratories typically require 100% outside air with ventilation rates ranging from 6 to 15 air changes per hour.
- ▶ ASHRAE 90.1 indicates that energy recovery to pre-conditioned make-up air is a suggested energy savings method for laboratories in excess of 5,000 cfm.
- ▶ NFPA 45 states only general exhaust can utilize air-to-air energy recovery due to the potential of cross contamination. Vektor-ERS utilizes a coil loop system for energy recovery, eliminating the possibility of cross-contamination and recovers more exhaust energy.
- ▶ Studies show that approximately 50% of the energy costs associated with operating a laboratory are the result of heating and cooling the make-up air. The addition of energy recovery can significantly reduce this cost.



**Vektor-MD  
with ERS 30**



Models Vektor®-MD, MH and MS  
are listed for electrical (UL/cUL 705),  
File No. E40001



	Run-Around Coil Loop Specifications
Type of Heat Transfer	Sensible
Sensible Effectiveness %	Up to 55%
Location of Exhaust/Supply Airstream	Separate
Cross-Contamination	None
Cross-Leakage	None
Temperature Range	-45° to 200°F

### **Vektor-ERS Features:**

- Seven pre-engineered energy recovery cabinet sizes
- Epoxy eCoat or baked phenolic coated coils
- Insulated double-wall plenum
- Run-around coil loop energy recovery
- Internal or external coil connections
- Physical separation between exhaust and supply airstreams
- MERV 8 or MERV 13 filters
- Single source responsibility



**Vektor-MD  
with ERS 30**

### **Advantages:**

- Pre-engineered ERS sized for flows from 2,000 to 66,000 cfm
- Improved ROI with pre-configured cabinet and coil combinations
- Integrated with laboratory exhaust fans
- Low volume systems save additional space with coil configured to match bypass air plenum.

### **Vektor-M Series Fan Features:**

- Nozzle options include high plume, high plume dilution and variable geometry nozzle
- Utilizes an efficient and quiet mixed flow impeller
- Bifurcated fan housing with motor, drive, and bearings located out of the airstream for safe, easy servicing
- AMCA licensed for Air, Sound and Induced Flow performance (AMCA 210, 300 and 260) - MD
- AMCA licensed for Air and Sound performance (AMCA 210 and 300) - MH, MS
- Single source responsibility

### **Applications:**

- University laboratories
- Pharmaceutical companies
- Biosafety laboratories
- Research facilities
- Any contaminated exhaust system where reducing energy cost is desired



**High Plume  
- MH**



**High Plume Dilution  
- MD**

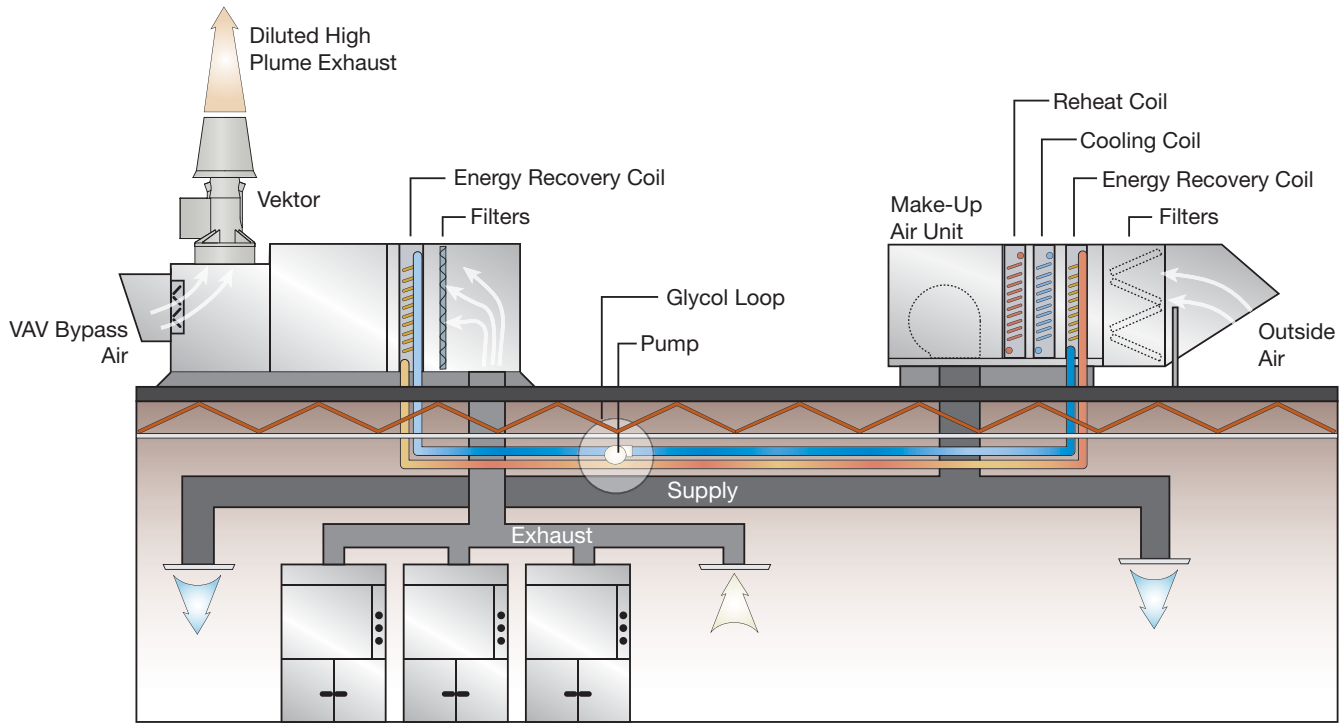


**Variable Geometry Nozzle  
- MS**



**Vektor-MH  
with ERS 8**

The Vektor-ERS uses a corrosion-resistant run-around liquid coil loop to recover energy from the laboratory exhaust airstream and transfer the energy to the laboratory make-up air. The energy transfer preheats make-up air in the winter and precools make-up air in the summer.



## Safe, Reliable, Cost-Effective

The run-around coil loop is a preferred method of recovering energy from hazardous lab exhaust because separation is maintained between the exhaust and supply airstreams, eliminating the concern of cross-contamination. The exhaust coil has a corrosion-resistant coating that ensures safe and consistent recovery of sensible energy. In subfreezing climates, a percentage of glycol is added to depress the freezing point of the circulated fluid. The Vektor-ERS system also eliminates the need to duct large volumes of supply and exhaust air to a common point—which is required with other energy recovery systems—reducing the Vektor-ERS system installed cost and improving economic payback.

## Significant Energy Savings

The Vektor-ERS can significantly reduce a laboratory facility's heating and cooling load. The tables to the right illustrate preheating and precooling temperatures of make-up air, and load reductions for various cities based on standard weather bin data. Greenheck offers a complete thermodynamic and economic analysis of a Vektor-ERS for your specific project.

	Winter / Preheated					Summer / Precooled		
Outdoor Air Temperature (°F)	-10	0	10	20	30	85	95	105
Preheat Air Temperature (°F)	31	36	41	46	51	79	82	89

*Preconditioning of make-up air based upon 72° exhaust and 50% energy recovery efficiency.*

City	MMBtu Saved Annually		Net Dollars Saved Annually
	Heating	Cooling	
Atlanta	2,956	(562)	\$16,604
Boston	5,198	(186)	\$20,385
Chicago	5,539	(269)	\$22,505
Cincinnati	4,597	(296)	\$19,482
Portland, OR	4,487	(131)	\$17,273
Syracuse	5,785	(169)	\$22,274

*Energy saving shown for annual operation, at outdoor TMY2 bin data for the specified location. Systems operating at 50,000 cfm, equal supply and exhaust; \$0.15/kWh, and \$3.50/MMBtu, assuming 85% heating efficiency.*

**NOTE:** kWh and MMBtu costs may vary by locale.

# Configurations and Construction

## Vektor-ERS Selection by Cabinet, Fan Quantity and Volume

Cabinet Size	Fan Quantity	Max Volume (cfm)	ERS Cabinet
5	1 or 2 with standby	5,100	Compact
8	1 or 2 with standby	7,700	
15	2	17,750	
20	1 or 2	22,400	Standard
30	1, 2 or 3	28,750	
40	1, 2 or 3	41,200	
60	2 or 3	66,000	



**Vektor-MH  
with ERS 5 1x1**



**Vektor-MH  
with ERS 8 2x1  
Inline**

Construction Feature		ERS Cabinet Size		
		5, 8, 15	20	30, 40, 60
Coil	Quantity	1	1	2
	Coating	Epoxy eCoat	Heresite	
	Frame	Galvanized	Stainless steel	
	Headers	Copper	Copper	
	Fins	Aluminum	Aluminum	
	Fins per inch (FPI)	8	8, 10	
	Rows	6	6, 8	
	Turbulators	No	Optional	
	Fin thickness	0.008	0.008	
	Tube thickness	0.025	0.025	
	Tube diameter	5/8 in.	5/8 in.	
	Connection size	Two-inch steel MPT (male pipe thread)	Three-inch steel MPT	
Vent / drain	FPT (female pipe thread)	FPT		
Cabinet	Inner wall	Painted steel	304 stainless steel	
	Outer wall	Painted steel	Painted steel	
	Insulation	Two-inch foam	Two-inch foam	
	Access doors	Filter	Filter and coil	
	Drain	Convenience	With pan	
	Piping	External	Internal, external	
	Intake	Side	Side, bottom	
Accessories	Lights	No	Optional	
	Magnehelic	No	Optional	
	Filter	None, MERV 8, MERV 13	None, MERV 8, MERV 13	
	Switch	No	Optional	
	Roof curb	Yes	Yes	



**Vektor-MH  
with ERS 15 2x1  
Parallel**



**Vektor-MD  
with ERS 20 1x1**

# Vektor®-ERS Standard Construction Features

## A Cabinet Construction

- Coated steel exterior with stainless steel interior or painted steel interior
- Double-wall construction with two-inch foam filled panels
- Stainless steel fasteners
- Bottom (standard cabinet) or side inlet locations
- Hinged access door with “tooled entry” handles (standard cabinet)

## B Coil Construction

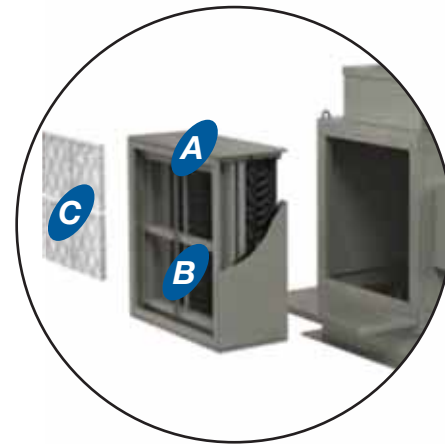
- Aluminum fins with copper tubing, corrosion-resistant coating
- Sized for maximum velocity of 500 ft/min
- Six row coils, eight fins per inch
- Eight row coils, ten fins per inch (optional)
- Rated in accordance with AHRI 410
- UL and ETL recognized
- Leak tested under water at 450 PSIG dry nitrogen

## C Filters

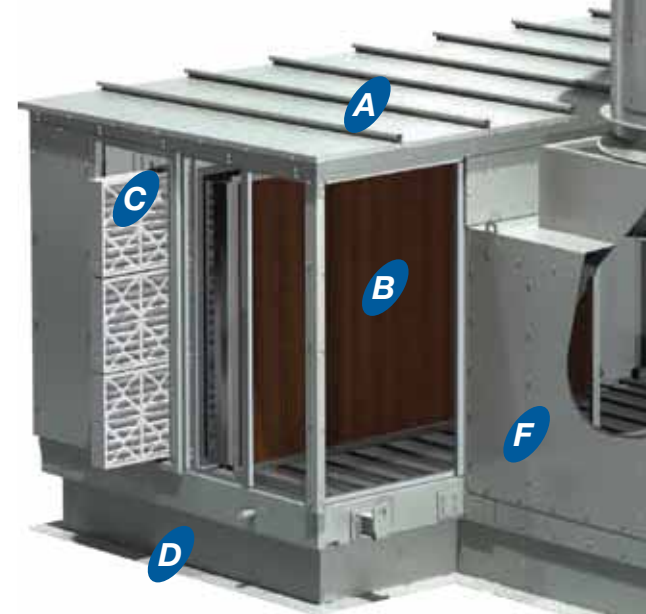
- Two-inch MERV 8, disposable pleated filters, up to 35% efficient
- Two or four-inch MERV 13, disposable pleated filters, up to 90% efficient

## D Coil Plenum Curb

- 12-gauge welded steel, coated with LabCoat™
- Insulated
- 12 inches high
- Gasket provided for curb seal
- Designed to withstand 125 mph wind-load rating without the use of guy wires



Compact

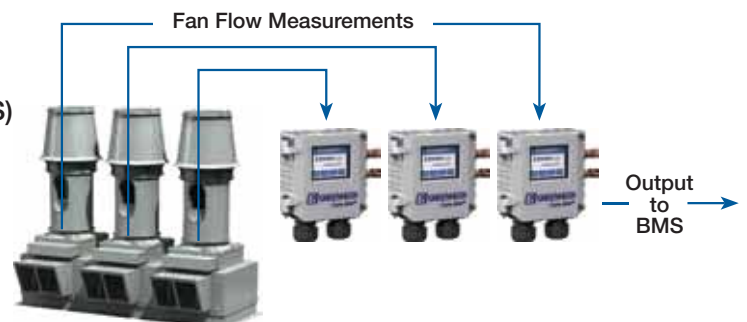


Standard

# Vektor Sure-Aire™... another energy saving system from Greenheck

Continuously monitor critical laboratory fan exhaust and building exhaust flow without airflow probes in the exhaust airstream. Benefits of the Sure-Aire™ system:

- Continuously measures critical fan and laboratory exhaust flow
- Reports values to Building Management System (BMS)
- No system effect or resistance to airflow
- No additional pressure loss
- No increase in fan RPM, sound or brake horsepower
- No additional energy cost for the building owner
- No probe corrosion to cause fan failure





### **E** Fan Construction

- Efficient and quiet mixed flow impeller technology
- Bifurcated housing with motor, belt and bearings out of the airstream
- Welded steel construction, coated with LabCoat™
- Belt or direct drive
- Totally enclosed fan cooled, premium efficient motors

### **F** Fan Plenum Construction

- Single-wall construction coated with LabCoat™
- Double-wall construction with 2 inch insulation, stainless steel liner (optional)
- Exterior steel walls coated with LabCoat™

### **G** Damper Features

- Isolation damper(s) completely accessible from exterior of system
- Bypass damper(s) are sized to match system requirements
- Welded steel, Hi-Pro Polyester coated airfoil blade design

### **H** Fan Cabinet Curb

- 12-gauge welded steel, coated with LabCoat™
- Insulated
- Minimum of 12 inches high
- Gasket provided for curb seal
- Designed to withstand 125 mph wind-load rating without the use of guy wires

## Vektor-ERS Options and Accessories

### **Magnehelic Gauge**

Measure air pressure drop across the filters indicating filter loading.



### **Vapor Tight Lights**

Moisture and corrosion-resistant construction with no exposed parts. Energy-efficient, compact fluorescent lamps.



**High Plume** - Effective means of creating a discharge plume height to prevent re-entrainment of chemical exhaust fumes into make-up air systems.



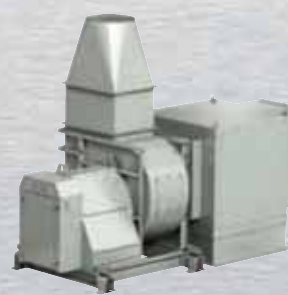
### Vektor-H

- High plume discharge nozzle
- Centrifugal wheel
- Compact design / sealed airstream components
- Up to 26,000 cfm and 4 in. wg



### Vektor-MH

- High plume nozzle
- Mixed flow wheel / bifurcated housing
- Compact design
- Up to 47,000 cfm and 11 in. wg



### Vektor-CH

- High plume nozzle
- Centrifugal wheel
- Up to 56,000 cfm and 12 in. wg

**High Plume Dilution** - Fan design that entrains and mixes outside ambient air into the exhaust airstream prior to exiting out the windband discharge. Potentially hazardous exhaust or exhaust fumes are diluted and dispersed quickly.



### Vektor-MD

- High plume discharge nozzle with entrainment and dilution
- Mixed flow wheel / bifurcated housing
- Compact design
- Up to 83,000 cfm and 11.5 in. wg



### Vektor-CD

- High plume discharge nozzle with entrainment and dilution
- Centrifugal wheel
- Highest efficiency / easy service design
- Up to 122,000 cfm and 13.5 in. wg

**High Plume Variable Geometry Nozzle (VGN)** - The discharge area automatically adjusts to maintain a constant discharge velocity and remain compliant to design codes. VGN maximizes effective plume heights during periods of reduced flow and lower discharge velocity fixed nozzles.



### Vektor-HS

- VGN discharge nozzle technology
- Variable volume flow – constant velocity discharge
- Centrifugal wheel
- Up to 26,000 cfm and 3.5 in. wg



### Vektor-MS

- VGN discharge nozzle technology
- Variable volume flow – constant velocity discharge
- Mixed flow wheel / bifurcated housing
- Up to 32,000 cfm and 10 in. wg



### Vektor-CS

- VGN discharge nozzle technology
- Variable volume flow – constant velocity discharge
- Centrifugal wheel
- Up to 32,000 cfm and 10 in. wg

## Our Commitment

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

Product warranties can be found online at [Greenheck.com](http://Greenheck.com), either on the specific product page or in the literature section of the website at [Greenheck.com/Resources/Library/Literature](http://Greenheck.com/Resources/Library/Literature).



Prepared to Support  
Green Building Efforts

