

# Energy Recovery Laboratory Exhaust Model Vektor®-ERS

For Vektor-C and Vektor-M Series



**VEKTOR**®



**GREENHECK**  
Building Value in Air.

February  
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Greenheck's Vektor-ERS is a pre-engineered laboratory exhaust energy recovery system. In combination with our Vektor-C or Vektor-M series blowers, this system effectively removes contaminated laboratory exhaust and disperses the exhaust high above the roof while conditioning supply air.

Vektor energy recovery exhaust systems utilize run-around coils to recover energy from the exhaust airstream and apply this energy to the make-up air system. Vektor-ERS offers a safe and efficient solution, eliminating 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 recovering 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:**

- Ten pre-engineered energy recovery cabinet sizes for different flow rates and fan configurations
- Epoxy or corrosion-resistant coating with anti-microbial properties
- 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

### **Applications:**

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

**Vektor-CD  
with ERS 25**



**Vektor-MD  
with ERS 30**

Compact size for lower volumes – coil and filter box bolts to the fan bypass air plenum, reducing cost by eliminating a special plenum.

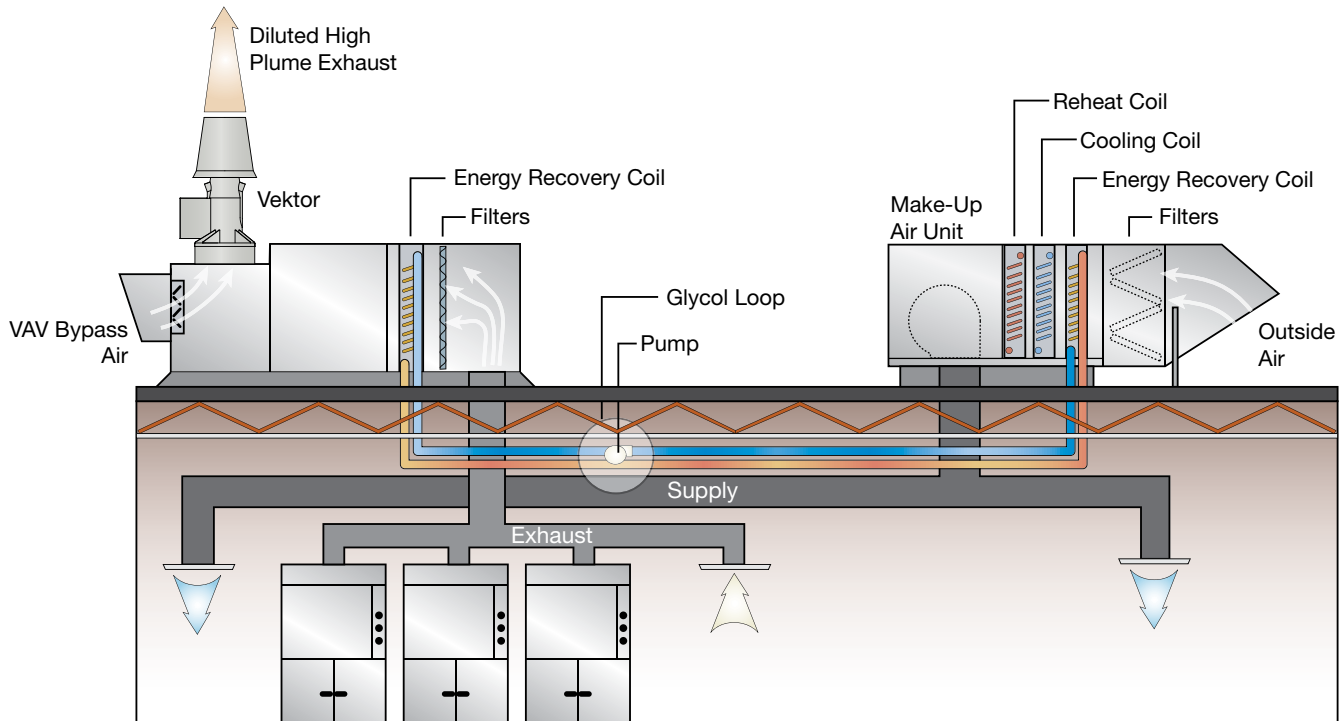
### **Advantages:**

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



**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 recovered 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

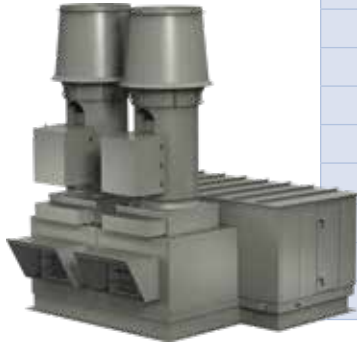
*Preconditioning of make-up air based upon 72° exhaust and 50% energy recovery efficiency.*

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.

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



Cabinet Size	Fan Series	Fan Quantity	Max Volume (cfm)	ERS Cabinet
5	M	1 or 2 with standby	5,100	Compact
8	M	1 or 2 with standby	7,700	
15	M	2	17,750	
20	M	1 or 2	22,400	Standard
25	C	1 or 2	25,000	
30	M	1, 2 or 3	28,750	
35	C	1 or 2	35,000	
40	C	1, 2 or 3	40,000	
40	M	1, 2 or 3	41,200	
60	M	2 or 3	66,000	



**M Series** - Mixed flow laboratory exhaust fan. Fans mount on top of a bypass air plenum. A more compact design.

**C Series** - Exhaust fan with scroll housing and non-overloading centrifugal wheel. Fan mount next to the energy recovery plenum.

Construction Feature		ERS Cabinet Size			
		5, 8, 15	20	30, 40, 60	25, 35, 40
<b>Fan Type</b>		Vektor-MD, MH or MS			Vektor-CD, CH or CS
<b>Cabinet</b>	Inner wall	Coated steel	304 stainless steel		Steel
	Outer wall	Coated steel	Coated steel		Coated steel
	Insulation	Two-inch foam	Two-inch foam		Two-inch foam
	Access doors	Filter	Filter and coil		Filter and coil
	Drain	Convenience	With pan		With pan
	Piping	External	Internal, external		Internal, external
	Intake	Side	Side, bottom		Side
<b>Coil</b>	Quantity	1	1	1 or 2	1 or 2
	Coating	Epoxy eCoat	Corrosion resistant with anti-microbial properties		Epoxy eCoat
	Frame	Galvanized	Stainless steel		Galvanized
	Headers	Copper	Copper		Copper
	Fins	Aluminum	Aluminum		Aluminum
	Fins per inch (FPI)	8	8, 10		8, 10
	Rows	6	6, 8		6, 8
	Turbulators	No	Optional		Optional
	Fin thickness	0.008	0.008		0.008
	Tube thickness	0.025	0.025		0.025
	Tube diameter	5/8 in.	5/8 in.		5/8 in.
	Connection size	Two-inch steel MPT (male pipe thread)	Three-inch steel MPT		Two-inch steel MPT
	Vent/drain	FPT (female pipe thread)	FPT		FPT
<b>Accessories</b>	Lights	No	Optional		No
	Magnehelic	No	Optional		No
	Filter	None, MERV 8, MERV 13	None, MERV 8, MERV 13		None, MERV 8 or MERV 13
	Light switch	No	Optional		No
	Roof curb	Yes	Yes		Yes



## 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
- Side inlet location (bottom optional on M standard cabinet)
- Hinged access door with “tooled entry” handles (standard cabinet)

## B Coil Construction

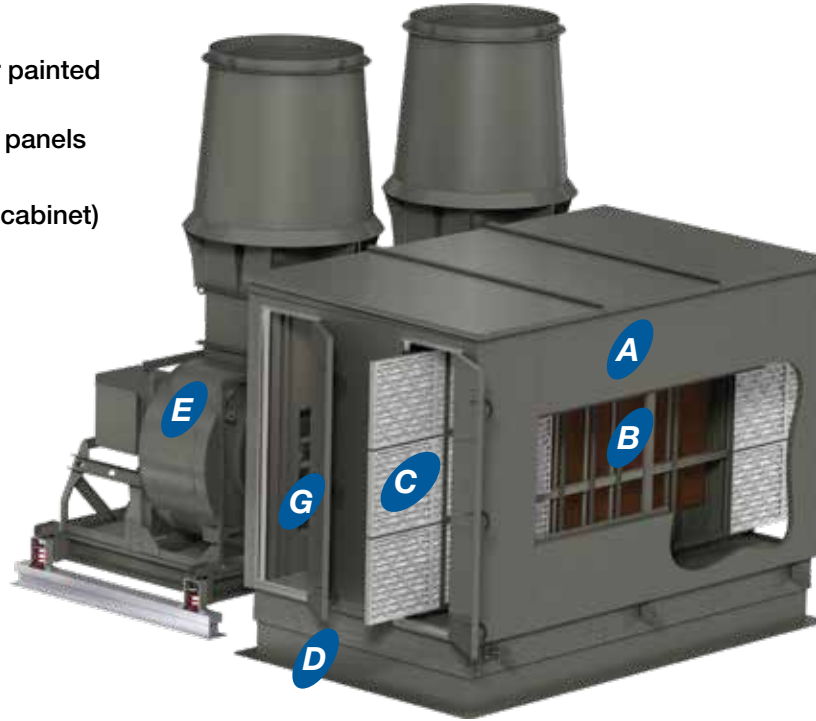
- Aluminum fins with copper tubing, corrosion-resistant coating
- Sized for maximum velocity of 500 ft/min
- Six row coils, eight fins per inch
- Eight row coils, ten fins per inch (optional)
- Rated in accordance with AHRI 410
- UL and ETL recognized
- Leak tested underwater at 450 PSIG dry nitrogen

## C Filters

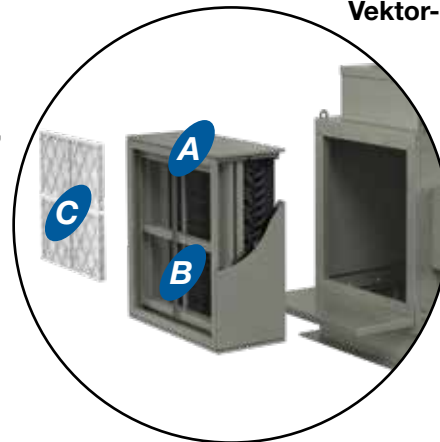
- Two-inch MERV 8, disposable pleated filters, up to 35% efficient
- Two or four-inch MERV 13, disposable pleated filters, up to 90% efficient

## D Roof Curb

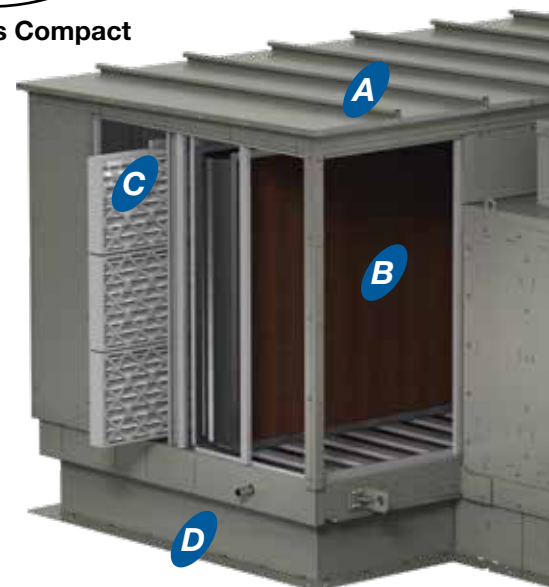
- 12-gauge welded steel, coated with LabCoat™
- Insulated
- 12-inches high
- Gasket provided for curb seal
- Designed to withstand 125 mph wind-load rating without the use of guy wires



Vektor-C Series Standard



Vektor-M Series Compact



Vektor-M Series Standard



### **E** Fan Features

- Designed for life safety
- Multiple fan types – Inline or scroll fan housings
- Drive components isolated from contaminated airstream
- Multiple discharge options
- Belt or direct drive
- Different fan configurations and designs to suit the application
- Designed to withstand up to 125 mph wind-loads without guy wires

### **F** Fan Plenum Construction (Standard ERS)

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

### **G** Damper Features

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

## Vektor-ERS Options and Accessories

### Magnehelic Gauge

Measure air pressure drop across the filters indicating filter loading.



### Vapor Tight Lights

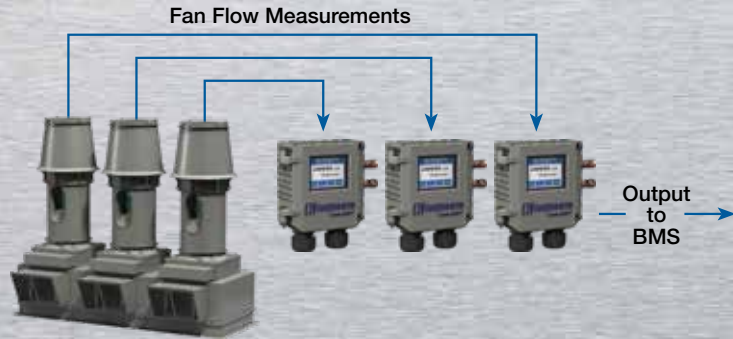
Moisture and corrosion-resistant construction with no exposed parts. Energy-efficient, compact fluorescent lamps.

# **VEKTOR<sup>®</sup>-ERS Energy Saving Features**

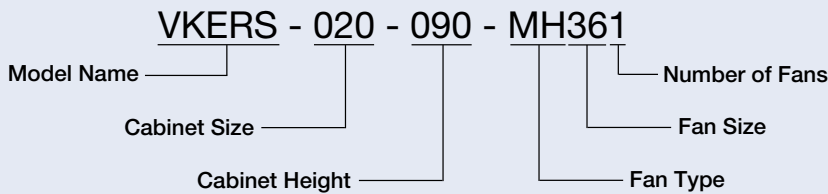
## Vektor Sure-Aire™

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



## Model Number Nomenclature



## 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).

