

Energy Recovery Laboratory Exhaust Model Vektor®-ERS

For Vektor-C and Vektor-M Series



VEKTOR®



GREENHECK
Building Value in Air.

May
2024

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 and Vektor®-CD, CH and CS 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:

- Twelve 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.

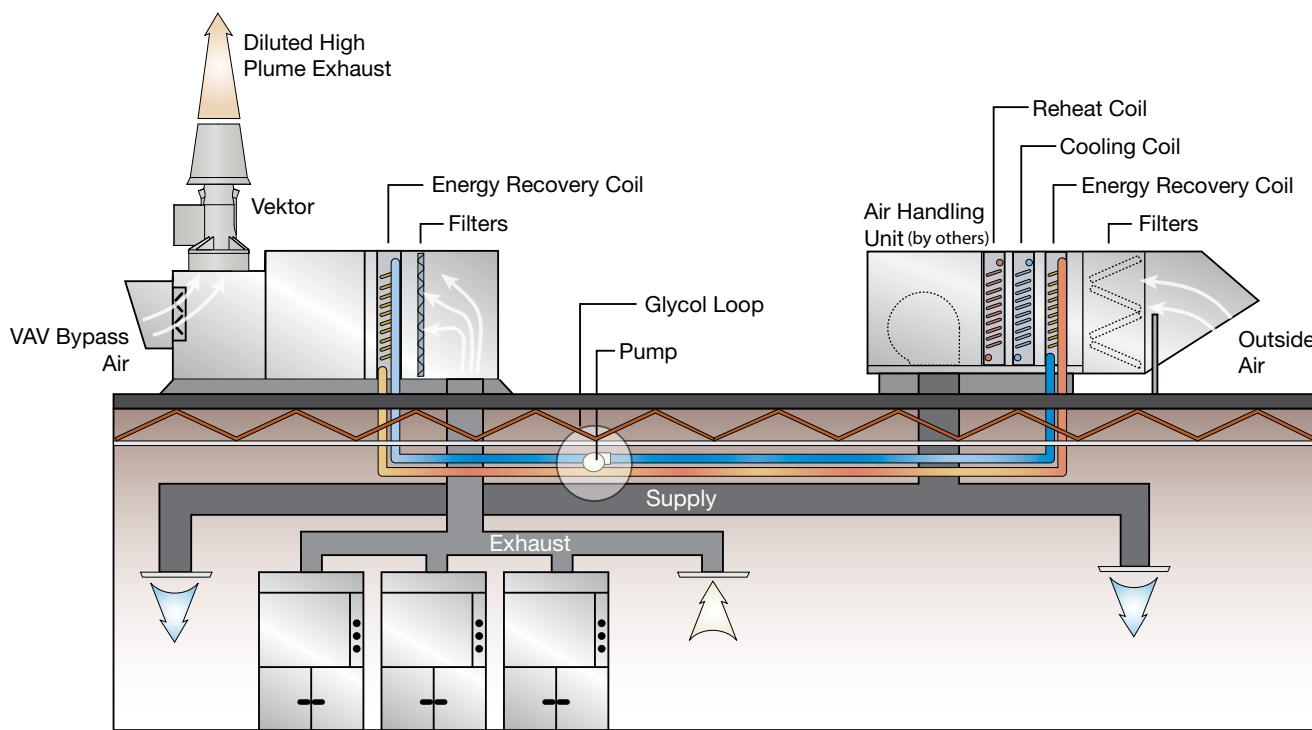
Advantages:

- 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 savings 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



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

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	
55	C	3	55,000	
60	M	2 or 3	66,000	
65	C	3	65,000	



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

Construction Feature		ERS Cabinet Size				
		5, 8, 15	20	30, 40, 60	25	35, 40, 55, 65
Fan Type		Vektor-MD, MH or MS			Vektor-CD, CH or CS	
Cabinet	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	
Coil	Quantity	1	1	1 or 2	1	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	
Accessories	Lights	No	Optional		No	
	Magnehelic	No	Optional		No	
	Filter	None, MERV 8 or MERV 13	None, MERV 8 or MERV 13		None, MERV 8 or MERV 13	
	Light switch	No	Optional		No	
	Roof curb	Yes	Yes		Yes	

Vektor®-ERS Standard Construction Features

A Cabinet Construction

- Coated steel exterior with stainless steel or painted steel interior
- Double-wall construction with two-inch foam-filled panels
- Stainless steel fasteners
- Side inlet location (bottom optional on series M standard cabinet)
- Hinged access door with “tooled entry” handles (standard cabinet)

B Coil Construction

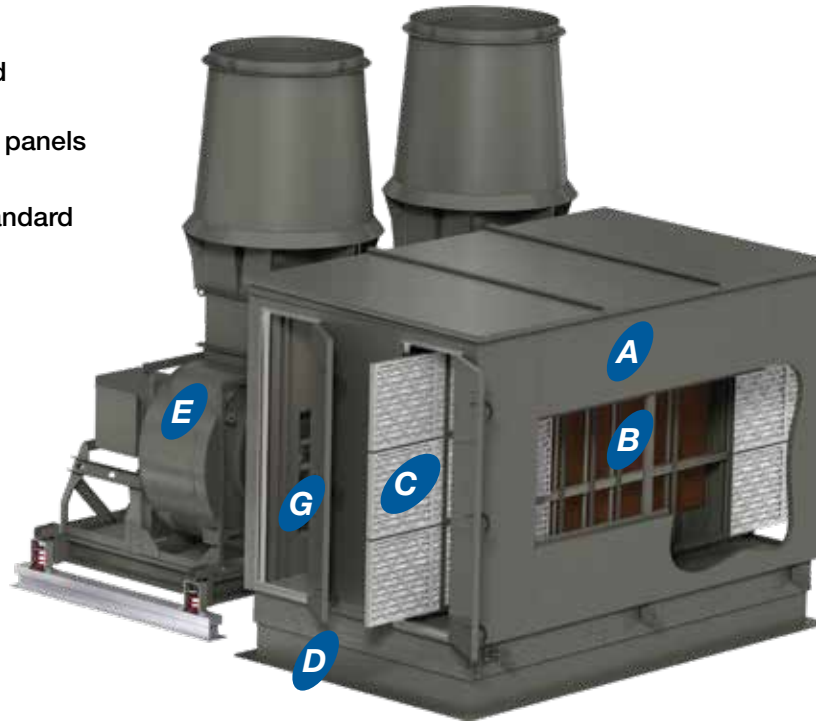
- Aluminum fins with copper tubing, corrosion-resistant coating
- Sized for maximum velocity of 500 ft/min
- Six row coils, eight fins per inch
- Eight row coils, ten fins per inch (optional)
- Rated in accordance with AHRI 410
- UL and ETL recognized
- Leak tested underwater at 450 PSIG dry nitrogen

C Filters

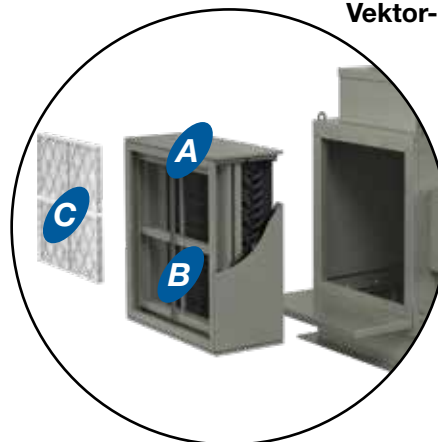
- Two-inch MERV 8, disposable pleated filters, up to 35% efficient
- Two or four-inch MERV 13, disposable pleated filters, up to 90% efficient

D Roof Curb

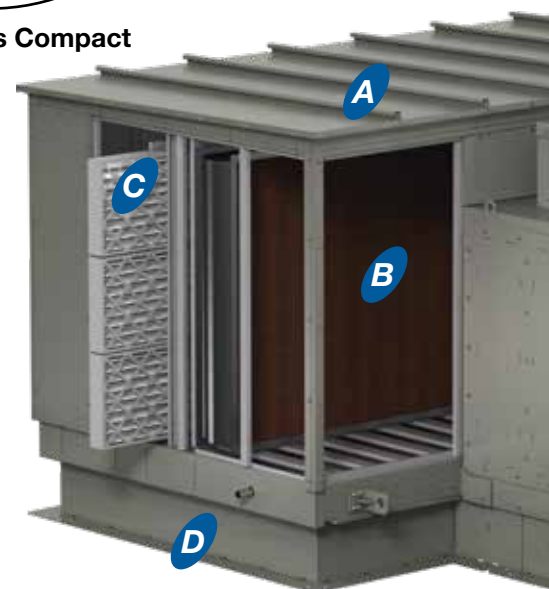
- 12-gauge welded steel, coated with LabCoat™
- Insulated
- 12-inches high
- Gasket provided for curb seal
- Designed to withstand 125 mph wind load rating without the use of guy wires



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.

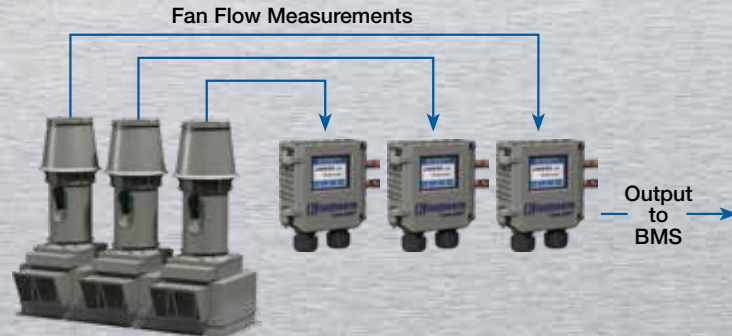


VEKTOR®-ERS Energy Saving Features

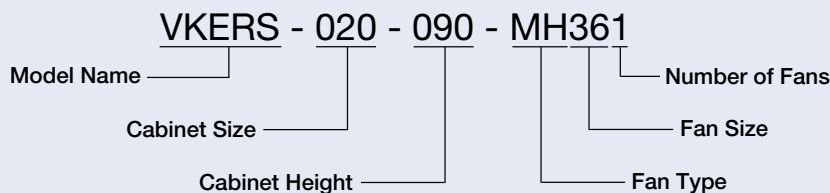
Vektor Sure-Aire™

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, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

