

Suffolk  
65 Allerton St.  
Boston, MA 02119  
617-445-3500



THE REVIEW OF THIS SUBMITTAL BY SUFFOLK DOES NOT RELIEVE THE SUBCONTRACTOR OR SUPPLIER OF HIS RESPONSIBILITY FOR THE QUANTITY, OR ACCURACY OF THIS WORK HEREIN REPRESENTED, OR ANY DEVIATION FROM THE PLANS, SPECIFICATIONS, AND CONTRACT.

Proj # \_\_\_\_\_

REVIEWED     
  REVIEWED AS NOTED     
  REVISE & RESUBMIT     
  REJECTED

BY \_\_\_\_\_ DATE \_\_\_\_\_

SUBM # \_\_\_\_\_  
COMMENTS \_\_\_\_\_

SWANSON RINK SUBMITTAL/SHOP DRAWING DISCIPLINE REVIEW MATRIX					
	NXT	MCN	R&R	REJ	NR
MECHANICAL	✓				
PLUMBING/FIRE PROT.					✓
ELECTRICAL	X				
LIGHTING					X
FIRE ALARM					X
TELECOM					X
SECURITY					X
AUDIO/VIDEO					X
AVIATION					X
CONTROLS					X
NXT = NO EXCEPTIONS TAKEN MCN = MAKE CORRECTIONS NOTED R&R = REVISE AND RESUBMIT REJ = REJECTED NR = NOT REVIEWED					

SWANSON RINK SUBMITTAL/SHOP DRAWING REVIEW	
<input type="checkbox"/> NO EXCEPTIONS TAKEN	<input type="checkbox"/> ADDRESS COMMENTS NOTED
<input type="checkbox"/> REJECTED	<input type="checkbox"/> REVISE AND RESUBMIT
<input type="checkbox"/> NOT REVIEWED	<input checked="" type="checkbox"/> SEE SEPARATE DISCIPLINE REVIEW MATRIX
<p>Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner. This submittal/shop drawing is in electronic format. As such, Swanson Rink is not liable for alterations to the content of this electronic document after it has been forwarded to other parties.</p>	
Reviewed By: <u>Shawn Plunkert</u>	Date: <u>10/14/24</u>



# Submittal Transmittal

88 S. Second Street  
Newark, OH 43055  
Phone: (740) 349-9411  
Fax: (740) 345-6020

**PROJECT NAME:** Suffolk - LCK062  
**PROJECT ADDRESS:** 2890 Beech Rd NW  
New Albany, OH 43031

**DATE:** 10/10/2024

**CONTRACT ID:** 24087

**MECHANICAL CONTRACTOR:**

KE Gutridge  
88 South 2<sup>ND</sup> Street  
Newark, Ohio 43055

**ENGINEER:**

Swanson Rink, Inc.  
1120 Lincoln Street #1200  
Denver, CO 80203

**GENERAL CONTRACTOR:**

Suffolk Construction Company  
65 Allerton Street  
Boston, MA 02119

**SPECIFICATION NAME & NUMBER:**

237200

**PRODUCT DESCRIPTION:**

Energy Recovery Ventilator (Rev 1): Product Data

**PRODUCT MANUFACTURER:**

Greenheck

**PRODUCT SUPPLIER:**

Air Control Products  
1201 Essex Avenue  
Columbus, OH 43201

**RETURN BY:** 10/17/2024

I CERTIFY THAT GUTRIDGE HAS CHECKED THIS SUBMITTAL FOR CONFORMANCE WITH PLANS AND SPECIFICATIONS.

SIGNED: \_\_\_\_\_

**\*\*\* PLEASE DO NOT MARK ABOVE THIS AREA. SPACE BELOW PROVIDED FOR NOTES AND STAMPS \*\*\***



**Air Control**  
Products, Inc.

1201 Essex Avenue, Columbus, Ohio 43201 (P) 614-299-1747 (F) 614-299-1301

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## **SUBMITTAL DATA**

**Date:**

**Job Name:**

**Manufacturer:**

**Product:**

**Spec Section:**

**Prepared For:**

**Prepared By:**

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**Notes:**

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Delivering Solutions & Service

[www.aircontrolproducts.com](http://www.aircontrolproducts.com)

## Minicore-5-VG-F Unit Performance

Design Conditions					
Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
817	98.8	67.1	24.5	195	180

Unit Specifications			
Qty	Weight (lb)	Unit Installation	Unit ETL Listing
3	215 (+/- 5%)	Indoor	UL 1812

Configuration			
Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	End	End	End

Energy Recovery Performance									
Design Condition	Temperature (F)								Capacity Reduction (BTU/h)
	Outdoor Air		Supply Air		Return Air		Exhaust Air		
	DB	WB	DB	WB	DB	WB/RH	DB	WB	
Summer	98.8	67.1	85.4	65.4	80.0	66.6/50.2	94.4	68.5	1,141.0
Winter	24.5	20.5	49.1	38.7	60.0	46.9/35.8	32.7	28.7	5,224.0

Air Performance							
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	195	0.5	0.511	981	1	Forward Curve	Direct
Exhaust	180	0.5	0.509	946	1	Forward Curve	Direct

Motor Specifications						
Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	0.07	1/4	ODP	N/A	1725
Exhaust	1	0.07	1/4	ODP	N/A	1725

Electrical Specifications					
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*	SCCR
Unit	208/60/1	3.8	15.0	0.545	5kA

\*Fan Power (W/CFM) = (Supply BHP + Exhaust BHP) / Supply CFM

### Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Indoor	Std
Energy Recovery Device - Fiber Membrane Energy Recovery Core	Std
Unit Construction - Single Wall	Std
Wall Insulation - 1/2 inch R2 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Two Direct Drive Forward Curved Blowers and VariGreen EC Motors	Std
Unit Finish - Galvanized Steel	Std
Four Factory Mounted Hanging Brackets	Std
Gravity Backdraft Dampers	Std
Outdoor Air Filters - 2" MERV 8, 1-15x20	Std
Exhaust Air Filters - 2" MERV 8, 1-15x20	Std
Single Point Power	Std
Factory Wired Non-Fused Disconnect Switch	X
Access - Bolt On	Std
Controls	
Unit Controls - By Others	
Unit On/Off Control - By Others	X
Supply Fan Control - 0-10 VDC Signal by Others	X
Exhaust Fan Control - 0-10 VDC Signal by Others	X

Accessories	
Frost Control - Timed Exhaust	X
Speed Control - Motor Potentiometer / 0-10 VDC Signal	X
Isolation Kit - Neoprene Hanging	X
Spare Filters - Both, Qty: 1 set(s)	X
Duct Flange	Std
Smoke Detector(s)	
Warranty Options	
Unit Warranty - 2.5 Yrs. (1 Yr. Extended)	X
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

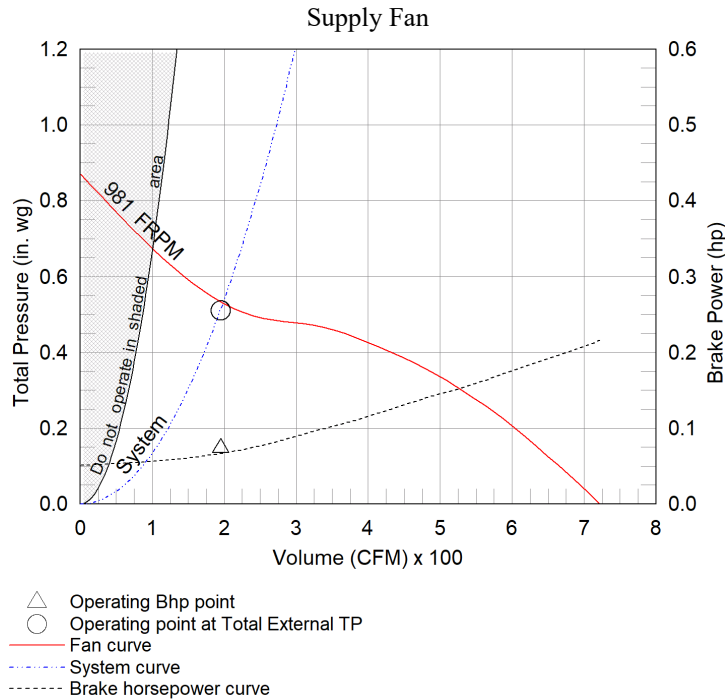
Notes
As standard, the MINIC is to be mounted in a horizontal orientation but can also be mounted on its side or a vertical position. Reference the MINIC IOM for more information.
MINIC includes standard gravity backdraft dampers for discharge air streams.
The intake and discharge positions shown in the drawings are not labeled because they are configurable. The supply and exhaust can be on either side, but the intake/discharge relationship must be maintained.

### Supply Fan Charts And Performance

Supply Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
195	0.5	0.511	981	0.07	1	1/4	1	Forward Curve	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
-	0.011	-	0.5	0.511

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
80.3	78.8	73.7	66.5	66.7	64.2	62.3	57	72.7	61.2	11.2

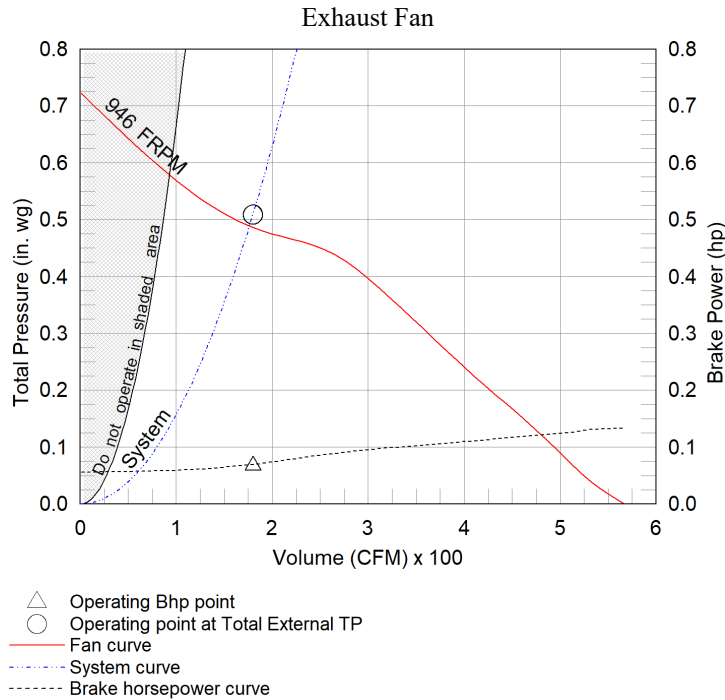


### Exhaust Fan Charts And Performance

Exhaust Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
180	0.5	0.509	946	0.07	1	1/4	1	Forward Curve	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
-	0.009	-	0.5	0.509

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
75.6	74.3	70	57.8	54.5	52.6	48.9	39.7	65	53.5	7

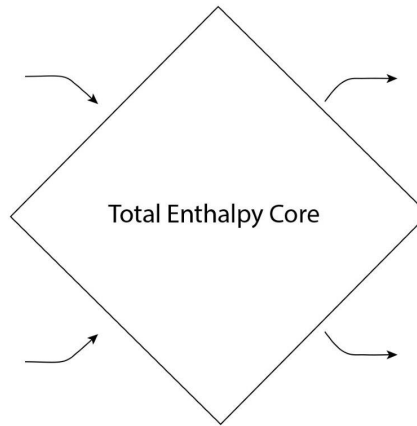


### Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
195	458.6	180	486.5

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
263.0	0.02	-878.0	0.00	0.10

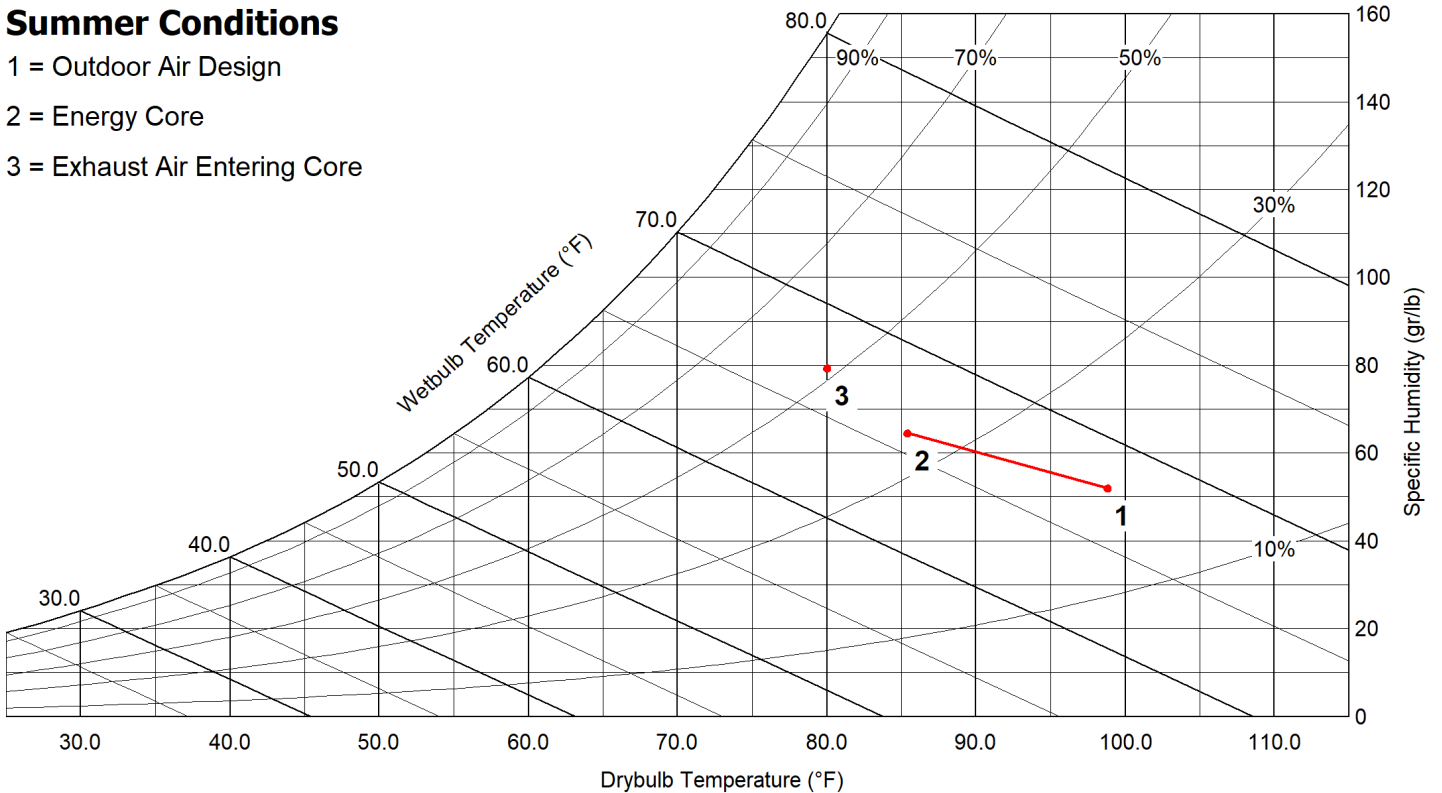
Outdoor Air Entering	
Dry Bulb (F)	98.8
Wet Bulb (F)	67.1
Specific Humidity (gr/lb)	52
Enthalpy (BTU/lb)	31.9
Indoor Air Entering	
Dry Bulb (F)	80.0
Wet Bulb (F)	66.6
Specific Humidity (gr/lb)	80
Enthalpy (BTU/lb)	31.6



Exhaust Air Leaving	
Dry Bulb (F)	94.4
Wet Bulb (F)	68.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	32.9
Supply Air Leaving	
Dry Bulb (F)	85.4
Wet Bulb (F)	65.4
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	30.6

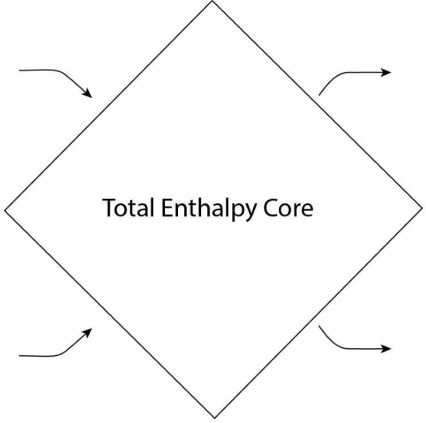
### Summer Conditions

- 1 = Outdoor Air Design
- 2 = Energy Core
- 3 = Exhaust Air Entering Core



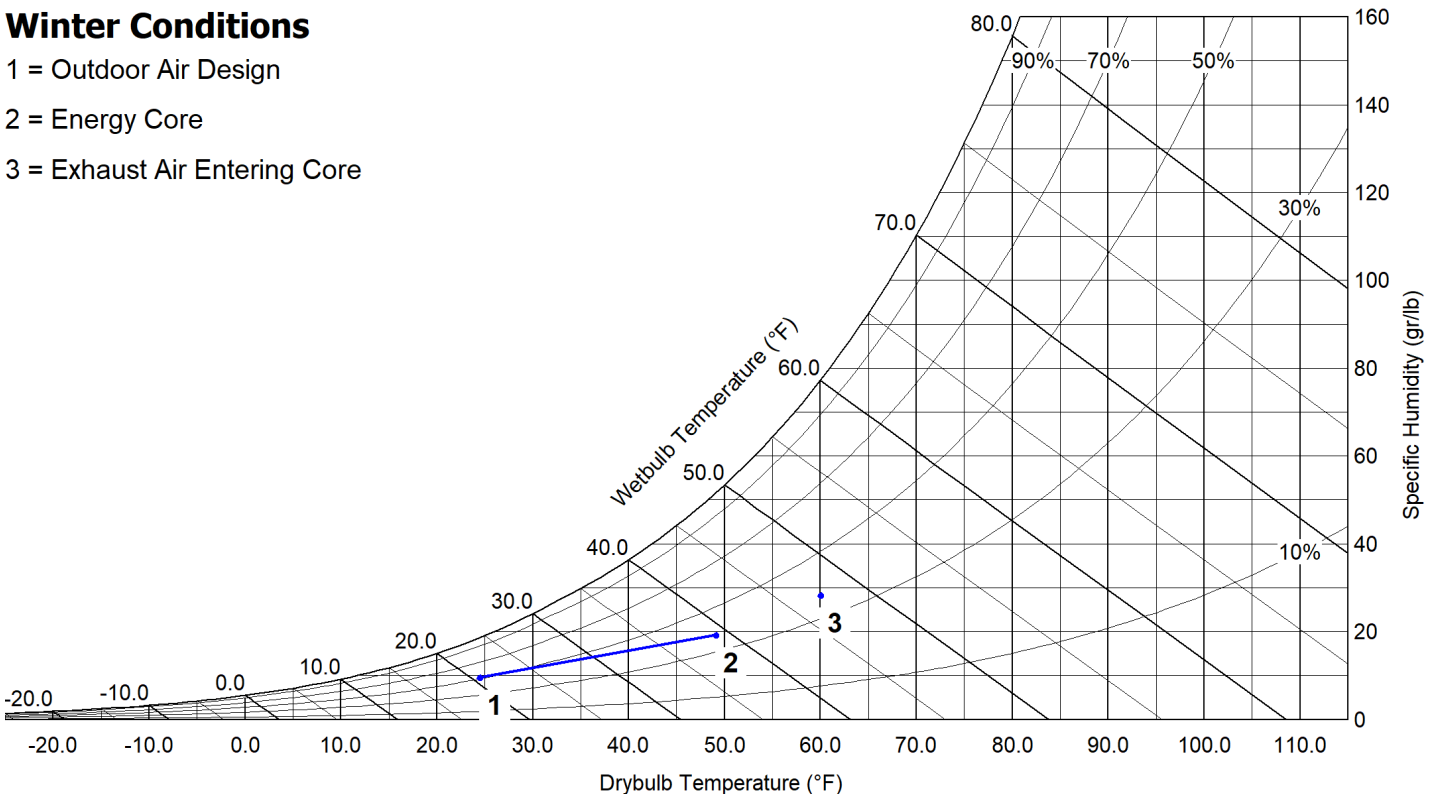
### Energy Recovery Winter Performance

Design Air Flow Conditions				Outdoor Air Heating Reduction			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness	OA Load w/o Energy Recovery (BTU/h)	OA Load with Energy Recovery (BTU/h)	Equipment Reduction (BTU/h)	Sensible Effectiveness (%)
195	64.8	180	71.8	7,539.0	2,315.0	5,224.0	69.2

<p><b>Outdoor Air Entering</b></p> <p>Dry Bulb (F) 24.5</p> <p>Wet Bulb (F) 20.5</p> <p>Specific Humidity (gr/lb) 10</p> <p>Enthalpy (BTU/lb) 7.3</p>	 <p>Total Enthalpy Core</p>	<p><b>Exhaust Air Leaving</b></p> <p>Dry Bulb (F) 32.7</p> <p>Wet Bulb (F) 28.7</p> <p>Specific Humidity (gr/lb) 17</p> <p>Enthalpy (BTU/lb) 10.5</p>
<p><b>Indoor Air Entering</b></p> <p>Dry Bulb (F) 60.0</p> <p>Wet Bulb (F) 46.9</p> <p>Specific Humidity (gr/lb) 28</p> <p>Enthalpy (BTU/lb) 18.8</p>		<p><b>Supply Air Leaving</b></p> <p>Dry Bulb (F) 49.1</p> <p>Wet Bulb (F) 38.7</p> <p>Specific Humidity (gr/lb) 19</p> <p>Enthalpy (BTU/lb) 14.8</p>

### Winter Conditions

- 1 = Outdoor Air Design
- 2 = Energy Core
- 3 = Exhaust Air Entering Core



### AHRI Performance Ratings

Energy Recovery Performance Rating in accordance with AHRI Standard 1060 (I-P)						
Rated Airflow (SCFM)		Net Supply Airflow (SCFM)	EATR (%)	OACF	Pressure Drop (in. wg)	
Leaving Supply	Entering Exhaust				Supply	Exhaust
195	180	195	0	1.06	0.25	0.23

Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
458.6	64.8	71.2	69.2	47.3	52.2	486.5	71.8

Note(s)
Summer Design Conditions: Unit is outside of the scope of AHRI ERV Certification Program, and is not AHRI Certified.
Winter Design Conditions: Unit is outside of the scope of AHRI ERV Certification Program, and is not AHRI Certified.
EATR application performance for an indoor mounted unit assumes 85% external static pressure (in. wg.) drop is on the outdoor air discharge.
OACF application performance for an indoor mounted unit assumes 85% external static pressure (in. wg.) drop is on the return air intake.

### Payback Analysis

Model Specifications		
Volume (CFM)		OA Core Enthalpy Recovery Ratio (%)
Supply	Exhaust	
195	180	458.6

Payback Inputs			
Operating Time	Electric Cost (USD/Kwh)	Heat Source	Heating Cost (USD/Kwh)
12 hours/day, 5 days/week	0.08	Gas	0.80

Equipment First Cost Calculation						
Total Cooling Load (tons)		Equipment Size (tons)		Equipment Reduction (tons)	Refrigerant Cost/tons (USD)	Air Conditioning Cost/tons (USD)
Without ER	With ER	Without ER	With ER			
0.02	0.00	1.00	0.00	1.00	50	650

Unit First Cost Reduction	
Unit First Cost without Energy Recovery (USD)	\$4,570
Avoided A/C Equipment Cost (USD)	-\$650
Net First Cost (USD)	\$3,920

Energy Cost and Savings	
Energy Cost Savings (USD)	Energy Cost due to Energy Core pressure drop
93	36

Net Operating Savings Per Year (USD)	\$57
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Payback Period (Years)	N/A
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### Energy Saving Analysis

Design Conditions									
Volume (CFM)		OA Enthalpy Recovery Ratio (%)		Outdoor (DB/WB)		Indoor (DB)		Relative Humidity (%)	
Supply	Exhaust	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
195	180	458.6	64.8	98.8 / 67.1	24.5 / 20.5	80.0	60.0	50.2	35.8

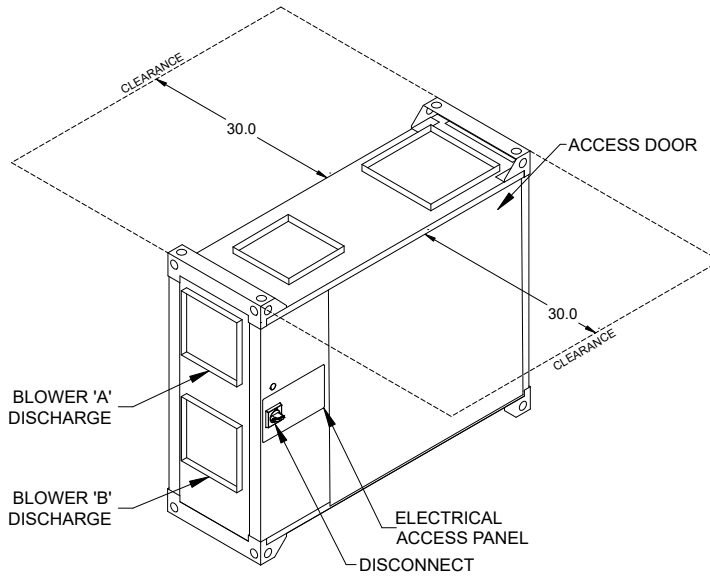
Cooling Analysis		
Cooling Range (F)	Total Hours Annually	Enthalpy (BTU/lb)
112.5	0	0.0
107.5	0	0.0
102.5	0	0.0
97.5	0	0.0
92.5	2	41.5
87.5	47	37.7
82.5	237	34.5
77.5	358	31.4
72.5	298	29.3

Heating Analysis	
Heating Range (F)	Total Hours Annually
62.5	314
57.5	229
52.5	189
47.5	204
42.5	166
37.5	241
32.5	209
27.5	124
22.5	84
17.5	73
12.5	44
7.5	15
2.5	12
-2.5	1
-7.5	0
-12.5	0
-17.5	0

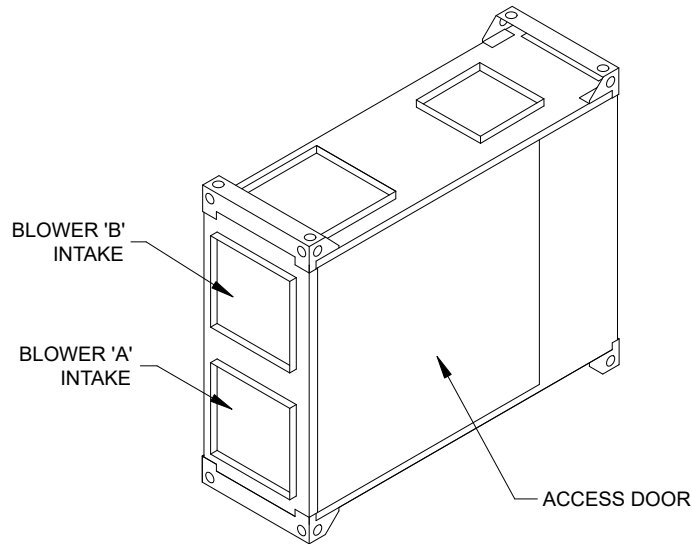
Energy Savings				
	Load w/o Energy Recovery (BTU)	Load with Energy Recovery (BTU)	Annual Savings (BTU)	Annual Savings (USD)
Cooling	883,477	-3,168,148	4,051,625	43
Heating	6,887,947	2,424,557	4,463,390	50
Energy Savings Cost				\$93

Notes				
Location	Operating Time	Electric Cost (USD)	Heat Source	Heating Cost (USD)
Columbus Port Columbus Intl Airport, OH (United States)	12 hours/day, 5 days/week	0.08	Gas	0.8

### Isometric Drawings

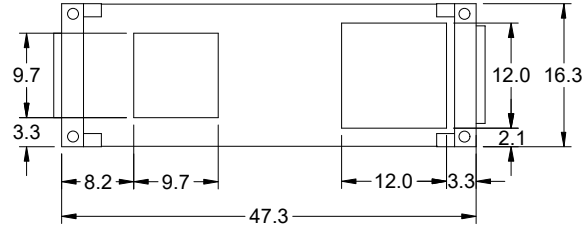


### Back Right Isometric

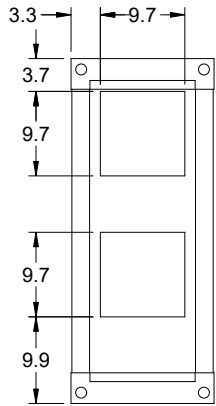


### Front Left Isometric

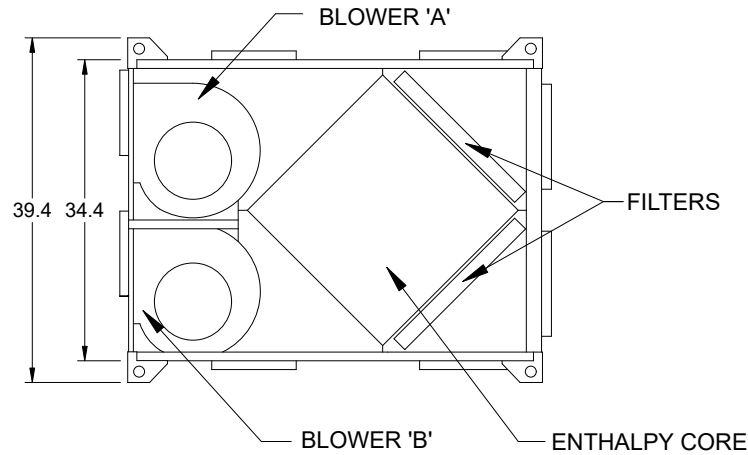
**Overview Drawings**



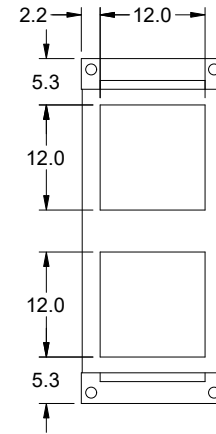
**Plan**



**Left End**

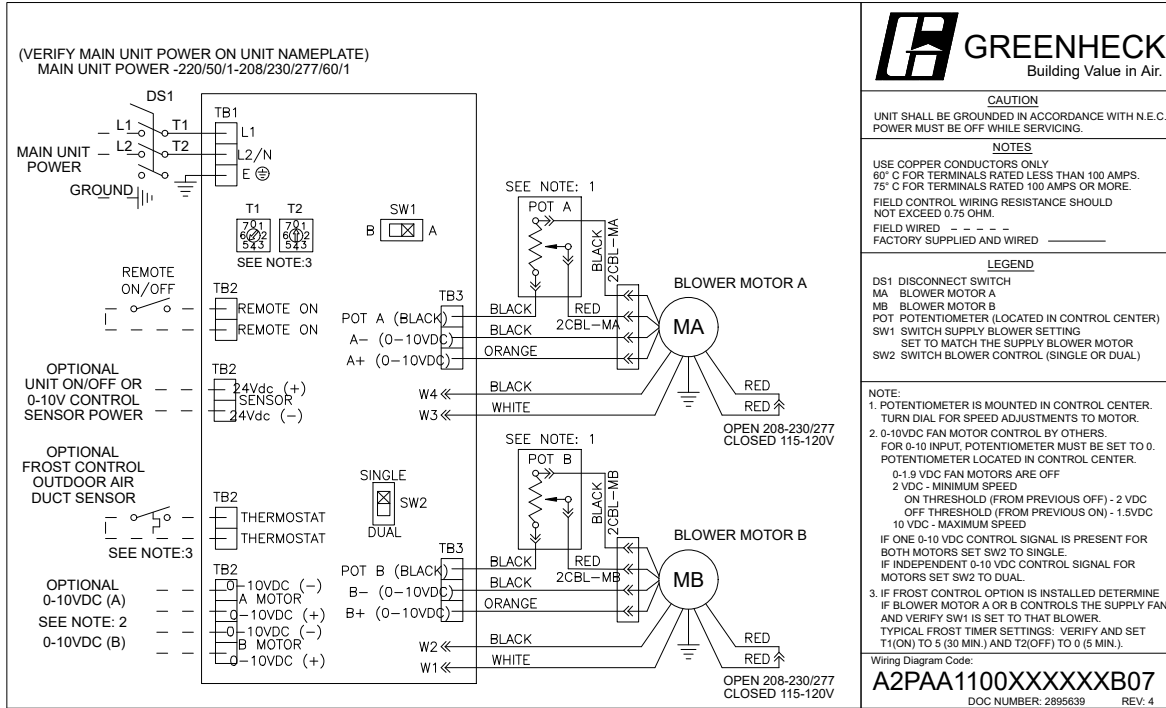


**Overview**



**Right End**

**Wiring Diagram**



## Warranty Statement for ERV Preconditioners

### Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 30 months from the date of shipment. Initial startup must be completed within six months of the shipment date, and a startup report must be submitted to Greenheck.

### Total Energy Core Warranty

The enthalpy core is warranted to be free from defects in material and workmanship for a period of 5 years from the shipment date.

### Warranty Notes

Any component which proves defective during the warranty period will be repaired or replaced at Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product. These warranties are exclusive and are in lieu of all other warranties, whether written, oral, or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. No person (including any agent or salesperson) has authority to expand Seller's obligation beyond the terms of this warranty, or to state that the performance of the product is other than that published by Seller.

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