January 19, 2023

Subject: Petsuites – Cypress Springs
7510 Fry Road
Cypress, Texas 77433
ASEI Project #220650

Re: Energy Recovery Unit Submittals

We have reviewed the submittals for the subject project and have the following comments, as indicated below.

1) All ERV units to be provided with CO2 sensors as noted in drawings.

☐ Reviewed ☑ Furnish as Corrected
☐ Rejected ☐ Revise and Resubmit
☐ Submit Specific Item

This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for: dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabricator processes or to the means, methods, techniques, sequences and procedures of construction; coordination of his or her work with that of all other trades; and performing all work in a safe and satisfactory manner.

ASEI Engineering
350 Glenborough Dr, #270
Houston, TX 77067
Phone: (713) 300-9579

Date: 01/19/23	By: ASEI

Sincerely,

David E. McCarthy, PE
Mechanical Engineer

ASEIENGINEERING
www.aseiengineering.com

COMFORT SYSTEMS USA SOUTH CENTRAL

SUBMITTAL DATA

Pet Suites - Cypress Springs
7510 Fry Road
Cypress, Texas 77433

SUBCONTRACTOR

Comfort Systems USA (South Central)
9745 Bent Oak Drive
Houston, TX 77040
P: 832-590-5700
F: 713-856-9720

ARCHITECT

Identity Architects Inc.
111 Travis St.
Houston, Texas 77002
(713) 595-2192

SUPPLIER

HD Grant Co.
5417 Renwick Dr. Suite C
Houston, Texas 77081
(713) 668-8880

GENERAL CONTRACTOR

Construction LTD
1825 Upland Drive
Houston, Texas 77043
(281) 884-2477

Specification Section: 23 74 16

Description: Energy Recovery Ventilation

SUBCONTRACTOR'S REVIEW

We have reviewed these items for conformance with the specifications and note the following exceptions.

Kelvin Jones
Project Manager

Date: 9/19/2022

GENERAL CONTRACTORS'S REVIEW

We have reviewed these drawings and certify to the best of our knowledge that all quantities, dimensions and materials conform to the information presented in the plans and specifications.

By: _____

Date: _____

Submittal Number: _____

ARCHITECT'S REVIEW

ENERGY RECOVERY VENTILATORS

SUBMITTAL DATA

JOB NAME: PETSUITES-CYPRESS SPRINGS

ENGINEER: ASEI ENGINEERING

LOCATION: CYPRESS, TEXAS

CONTRACTOR: COMFORT SYSTEMS USA SOUTH CENTRAL

DATE: SEPTEMBER 18, 2022

SUBMITTED BY

STEPHEN TAYLOR

H.D. GRANT COMPANY, INC.

5417 RENWICK DR.
HOUSTON, TX 77081
Phone No. (713) 668-8880
Fax: (713) 668-8887

ECV-20-P-H

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
105	98.0	80.0	27.0	1,360	1,360

Unit Specifications

Qty	Weight (lb)	Unit Installation	Unit ETL Listing
1	698 (+/- 5%)	Outdoor	UL 1812

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	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	98.0	80.0	81.8	70.5	75.0	62.5/50	91.0	73.7	56,304.0
Winter	27.0	22.7	55.9	43.9	70.0	54.3/35	40.1	35.9	42,802.0

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	1,360	0.5	1.265	1590	1	Plenum	Direct
Exhaust	1,360	0.5	1.196	1688	1	Plenum	Direct

Motor Specifications

Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	0.48	3/4	ODP	SE	1750
Exhaust	1	0.55	3/4	ODP	SE	1750

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	5.7	15.0	0.563

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

Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Outdoor	Std
Outdoor Air Filters - 2" MERV 8, 2-20x20	Std
Exhaust Air Filters - 2" MERV 8, 2-20X20	Std
Energy Recovery Device - Polymer Membrane Energy Recovery Core	Std
Unit Construction - Double Wall	X
Insulation - 1 inch R4 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Access - Hinged	X
Factory Wired Non-Fused Disconnect Switch	Std
Unit Finish - Galvanized	Std
Single Point Power	Std
Supply Weatherhood: Downturn	Std
Exhaust Weatherhood: Downturn	Std
Fan VFDs - Modulating	X
Fan Vibration Isolation - Neoprene	Std
Controls	
Unit Controls - Terminal Strip	X
Sensors	
Unit On/Off Control - By Others	X
Sensor Monitoring Package	
Heating Enable - None	
Cooling Enable - None	
Supply Fan Control	
Exhaust Fan Control	
Network Protocol	
Exhaust Only Operation	
Economizer Control	
Remote Panel	
Control Accessories	
Remote Display	
CO2 Sensor	
Dirty Filter Sensor(s)	
Airflow Monitoring - None	

Accessories	
Frost Control	
Spare Filters	
Shipped Loose Smoke Detectors	
Duct Flange	
Outdoor Air Damper - Low Leakage	X
Return Air Damper - Low Leakage	X
Service Outlet - 120 VAC GFCI Service Outlet, Shipped Loose	
Damper End Switch	
Roof Curb - GKD - 39.6/55.8-G14	X
Spare Fan Belts	
Warranty Options	
Unit Warranty - 18 Months (Std.)	Std
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

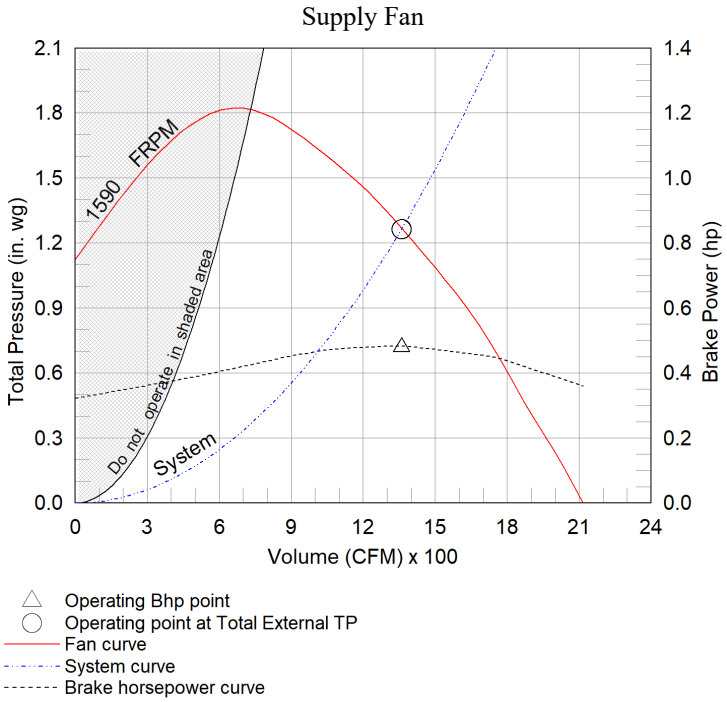
Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A
Return Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

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
1,360	0.5	1.265	1590	0.48	1	3/4	1	Plenum	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.088	0.069	0.01	0.5	1.265

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
78.9	77.4	79.7	71.4	67.1	62.9	61.1	66.7	75.4	63.9	14

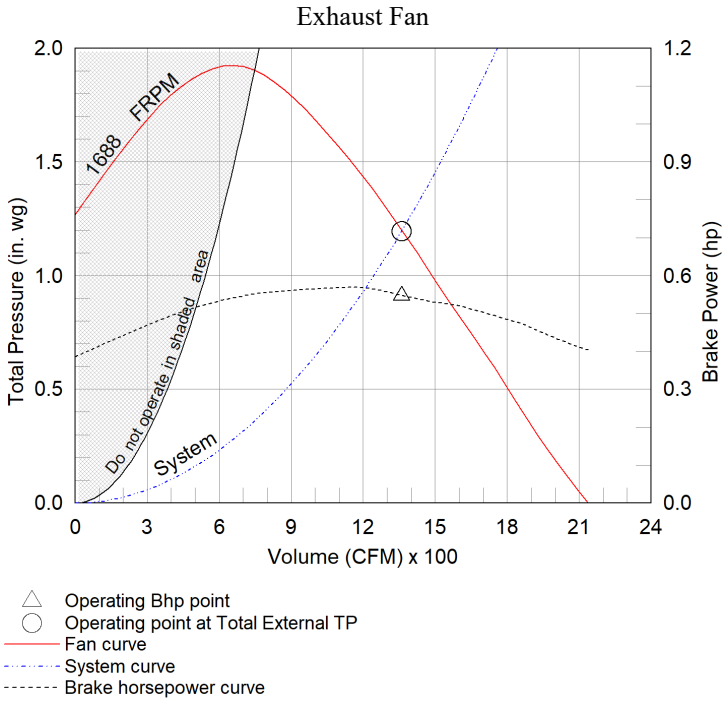


Exhaust Fan Charts And Performance

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
1,360	0.5	1.196	1688	0.55	1	3/4	1	Plenum	Direct

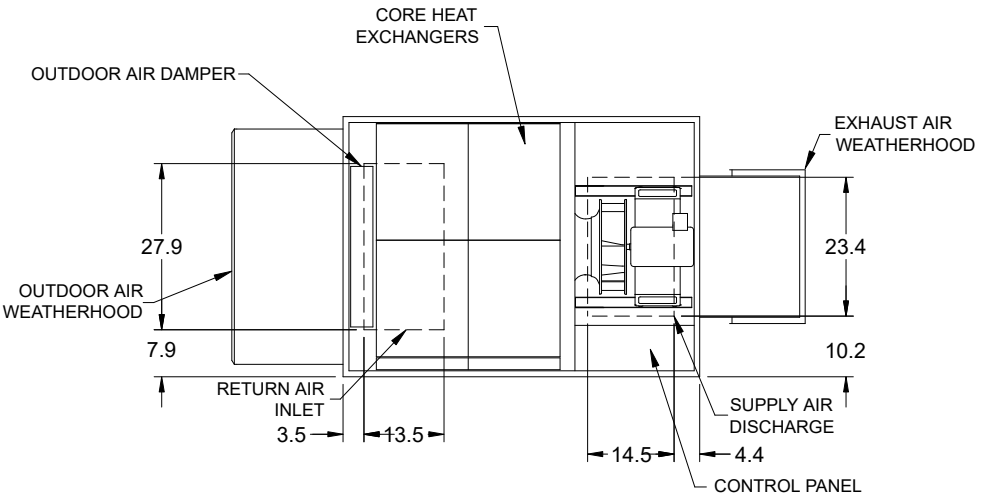
Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.019	0.069	0.013	0.5	1.196

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
72.4	70.3	73.7	63.4	55.3	52.3	50.8	45.3	67.4	55.9	7.8



Radiated Sound

Position A



Plan

Position D

Position B

Position C

"E" is the Top Plane

Radiated Sound Levels										
Plane	**Octave Bands (Lw)**								**Plane Lw**	**Plane LwA**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
A	78	75	71	70	70	70	68	64	82	76
B	79	76	73	72	76	75	73	69	84	81
C	78	75	70	70	70	69	68	64	81	76
D	75	70	67	64	61	60	56	50	77	67
E	76	70	71	69	68	68	67	63	80	75
Total	85	81	78	76	78	77	76	72	88	84

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

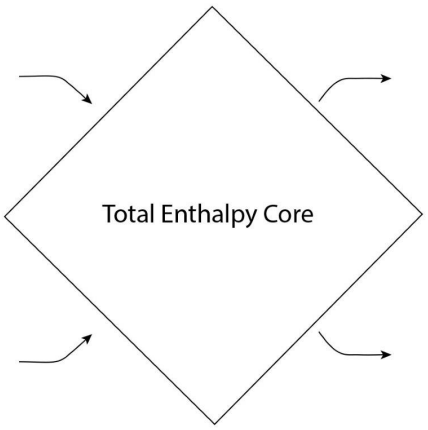
Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
1,360	59.5	1,360	59.1

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
94,248.0	7.85	37,944.0	3.16	4.69

Outdoor Air Entering	
Dry Bulb (F)	98.0
Wet Bulb (F)	80.0
Specific Humidity (gr/lb)	127
Enthalpy (BTU/lb)	43.6

Indoor Air Leaving	
Dry Bulb (F)	75.0
Wet Bulb (F)	62.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	28.2



Exhaust Air Leaving	
Dry Bulb (F)	91.0
Wet Bulb (F)	73.7
Specific Humidity (gr/lb)	97
Enthalpy (BTU/lb)	37.1

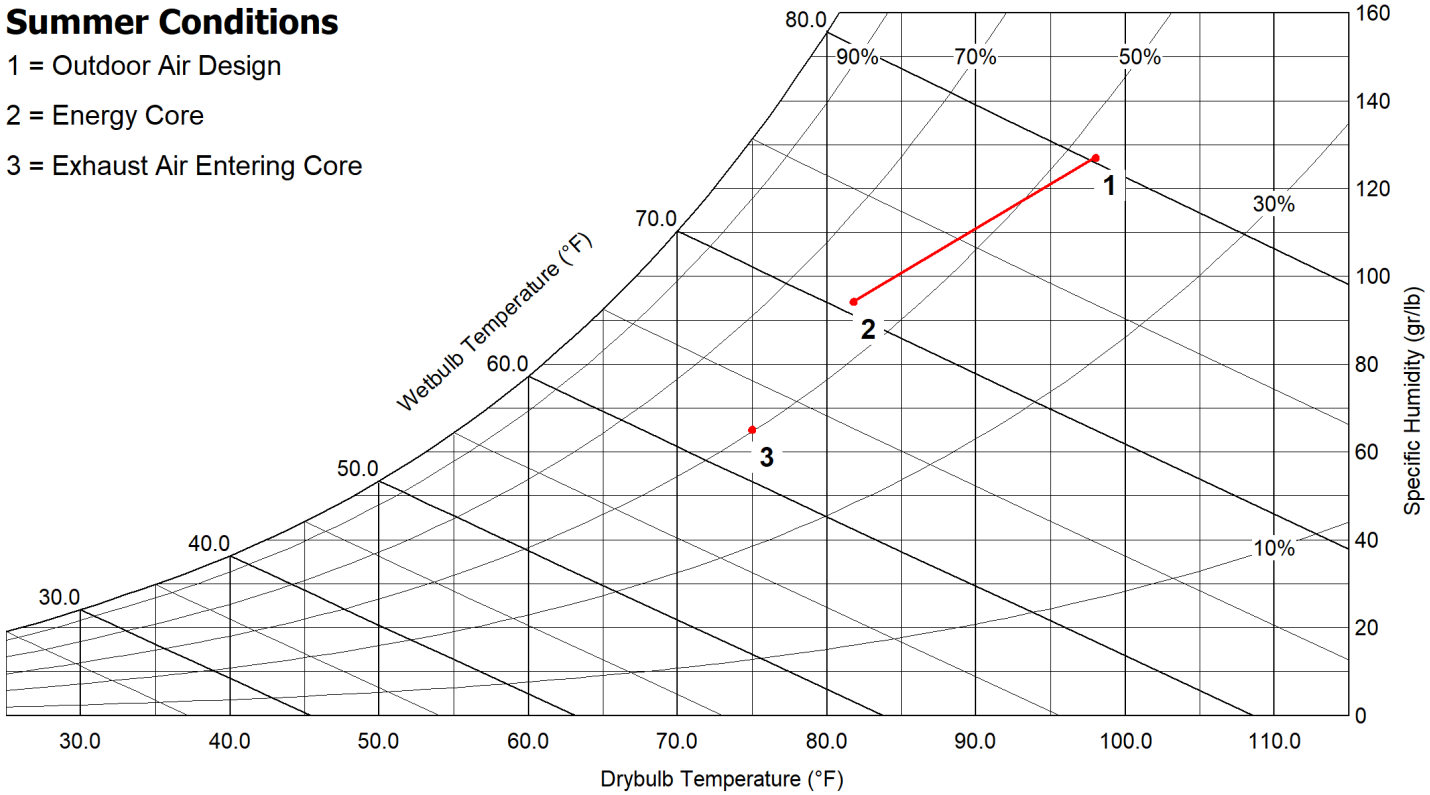
Supply Air Leaving	
Dry Bulb (F)	81.8
Wet Bulb (F)	70.5
Specific Humidity (gr/lb)	94
Enthalpy (BTU/lb)	34.4

Summer Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



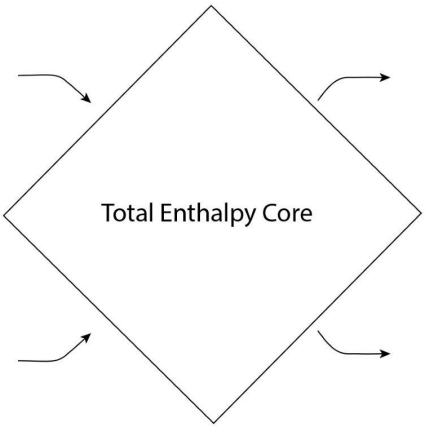
Energy Recovery Winter Performance

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Core Effectiveness**
1,360	61.3	1,360	63.2

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	**OA Load with Energy Recovery (BTU/h)**	**Equipment Reduction (BTU/h)**	**Sensible Effectiveness (%)**
63,685.0	20,883.0	42,802.0	67.2

Outdoor Air Entering	
Dry Bulb (F)	27.0
Wet Bulb (F)	22.7
Specific Humidity (gr/lb)	11
Enthalpy (BTU/lb)	8.1

Indoor Air Leaving	
Dry Bulb (F)	70.0
Rel. Humidity (%)	35
Specific Humidity (gr/lb)	38
Enthalpy (BTU/lb)	22.8



Exhaust Air Leaving	
Dry Bulb (F)	40.1
Wet Bulb (F)	35.9
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	13.4

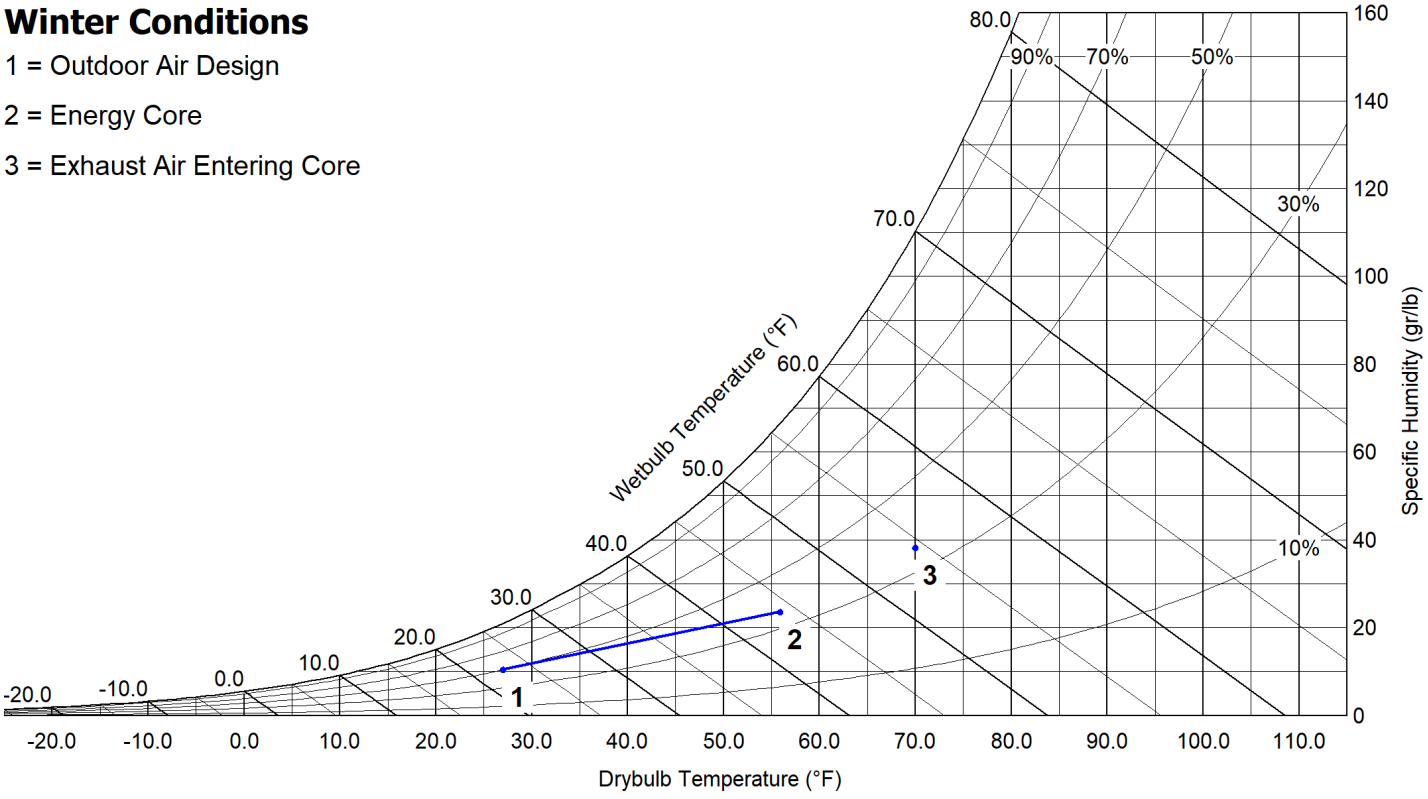
Supply Air Leaving	
Dry Bulb (F)	55.9
Wet Bulb (F)	43.9
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	17.1

Winter Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



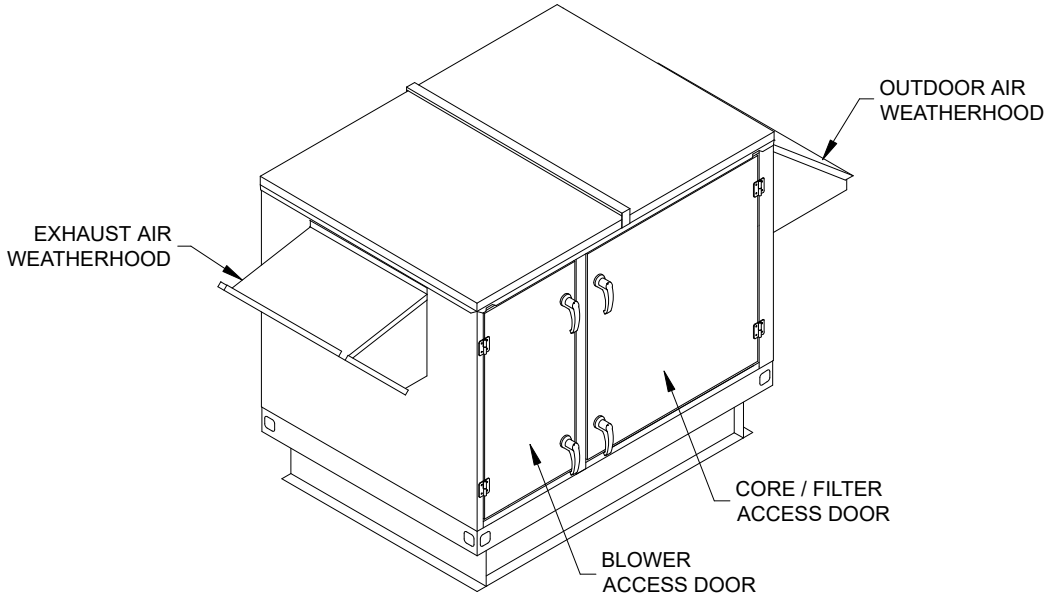
AHRI Performance Ratings

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
1362	1362	1360	0.1	1.05	0.59	0.59

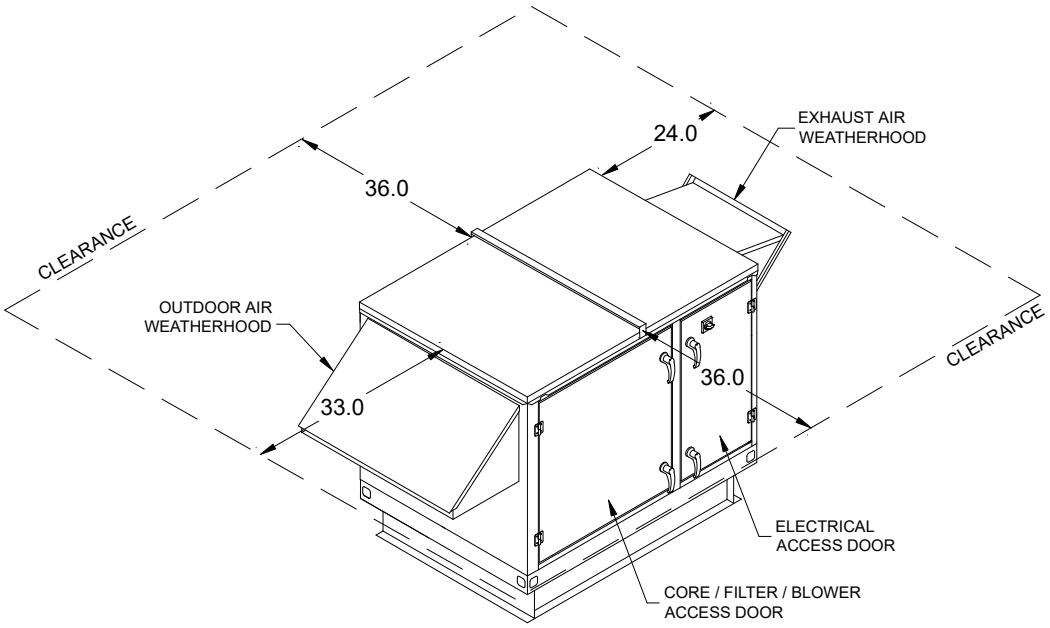
Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
59.5	61.3	70.5	67.2	52.1	47.6	59.1	63.2

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.

Isometric Drawings



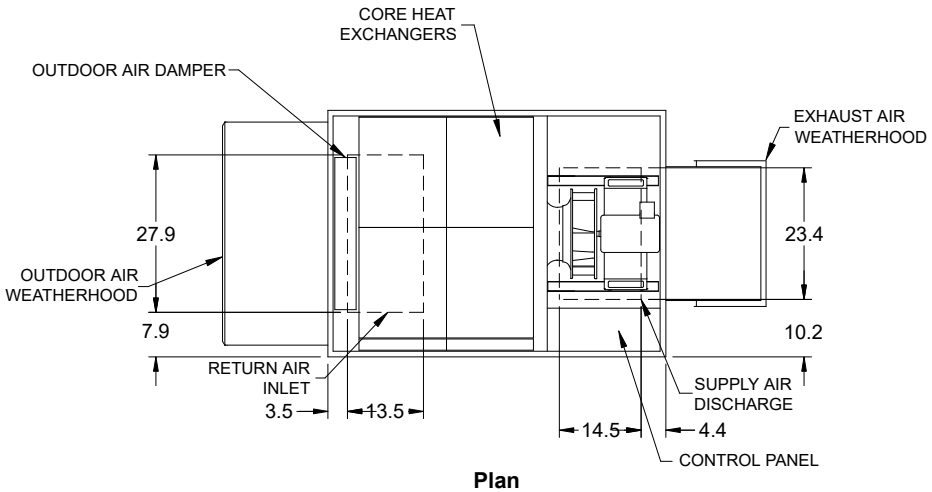
Back Right Isometric



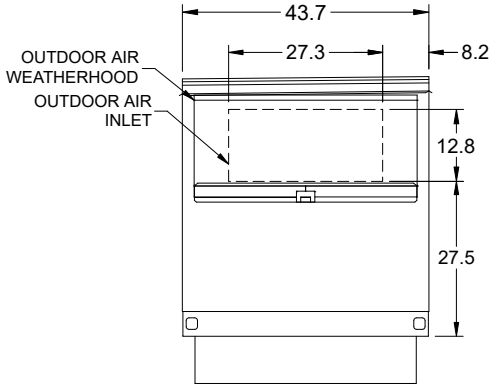
THE NON-ELECTRICAL SIDE CAN BE PLACED AGAINST A WALL. CLEARANCE TO THE ELECTRICAL SIDE IS ESSENTIAL TO PROVIDE ACCESS TO THE CONTROL CENTER AND COMPONENT MAINTENANCE.

Front Left Isometric

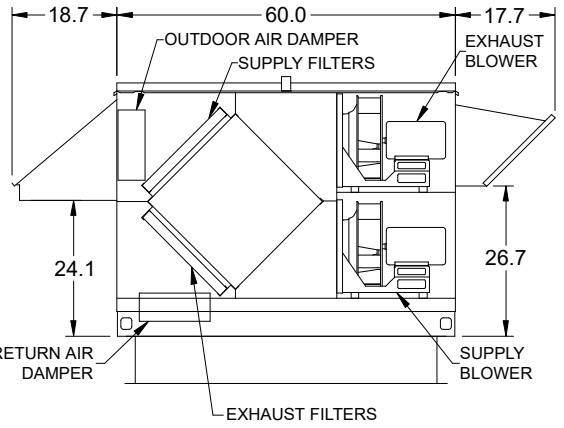
Overview Drawings



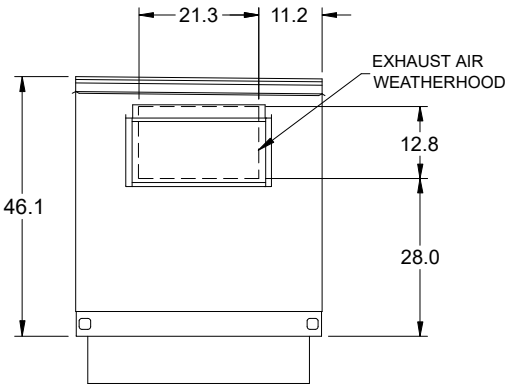
Plan



Left End

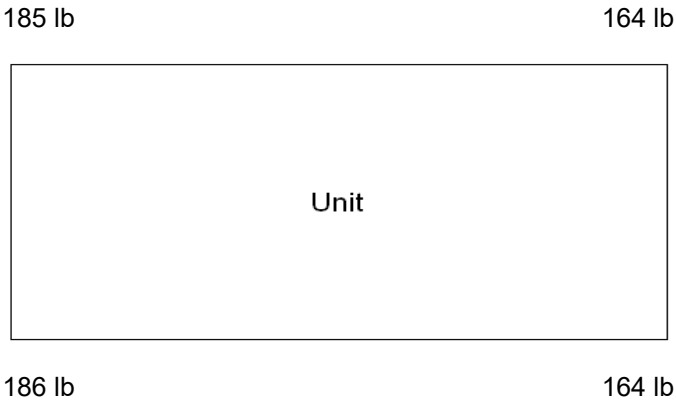


Elevation



Right End

Corner Weights



Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the left. Weights are applied at the base of the unit. Images not drawn to scale.

Terminal Strip Controls

BASIC UNIT CONTROLS:

The Energy Recovery Unit will be provided from the factory with an integral control center including: a single non-fused disconnect, 24 VAC transformer, terminal strip and fan VFDs.

ON/OFF CONTROL:

Within the unit control center, a digital signal must be field wired into the terminal strip (connecting terminals R and G) to control unit startup or shutdown.

This on/off signal is coming from:
By Others: The unit shall be energized by a field supplied and wired digital contact.

Startup (Digital Contact Closes)

- Factory mounted and wired outdoor air damper actuator is powered.
- Factory mounted and wired exhaust air damper actuator is powered.
- Exhaust fan ON.
- Supply fan ON.

Shutdown (Digital Contact Opens)

- Supply and exhaust fan de-energized.
- Outside air damper actuator de-energized, damper spring-return closed.
- Exhaust air damper actuator de-energized, damper spring-return closed.

CONTROL ACCESSORIES

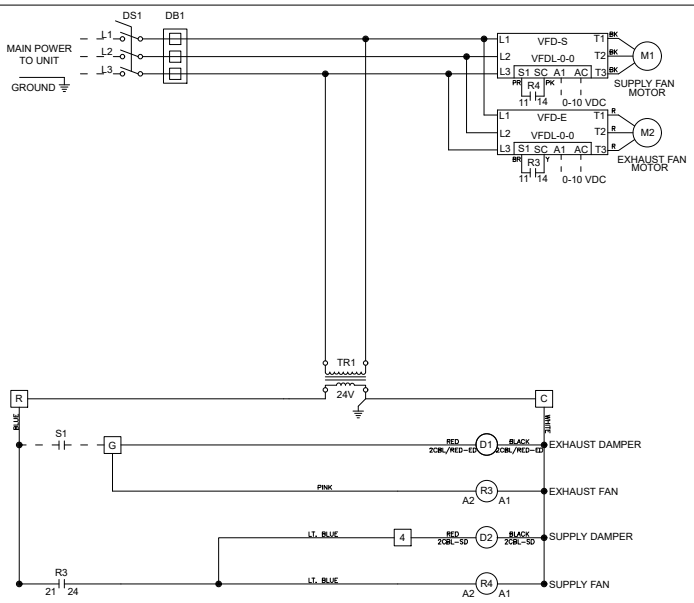
Supply Blower VFD – 0-10 VDC by others:

The supply blower will be provided with a factory mounted variable frequency drive. The supply blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Exhaust Blower VFD – 0-10 VDC by others:

The exhaust blower will be provided with a factory mounted variable frequency drive. The exhaust blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G3LCC1000CXXXXXE34

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D#	DAMPER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
M#	MOTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
S1	FAN SWITCH
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Template Drawing: E34 DOC NUMBER: 3687929 REV: ----

Warranty Statement for ERV Preconditioners

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 18 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.

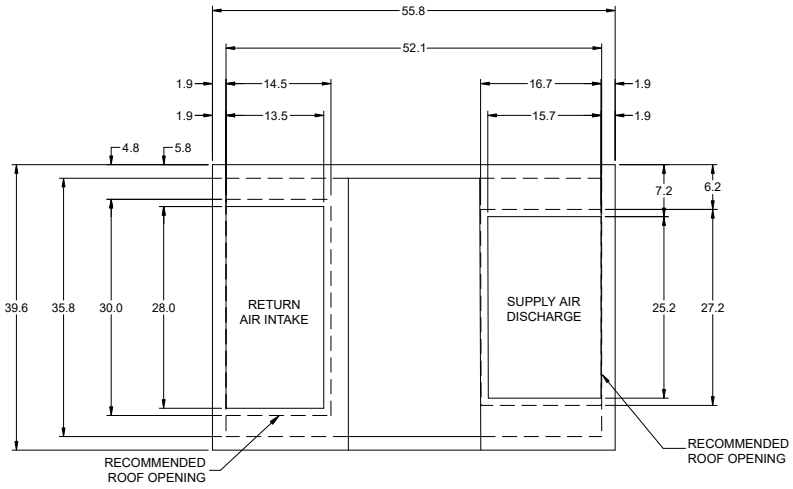
GKD Roof Curb

Model: GKD-39.6/55.8-G14

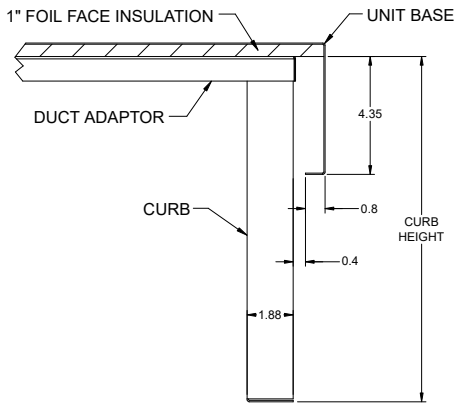
Curb Height (in.)	Curb Length (in.)	Curb Width (in.)	Material	Finish Type	Duct Adapter	Curb Weight (lb)
14	55.8	39.6	Galvanized	Galvanized	Yes	79

Standard Construction Features:
All dimensions shown in inches.
Weight shown is within +/-5%.
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.
18 gauge galvanized steel (perimeter channels).
18 gauge galvanized steel (interior channels).
Ships knocked down for field assembly.
Curb insulation to be provided by others.

Top View of Curb



Cross-Section View of Unit on Curb



ECV-30-P-H

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
105	98.0	80.0	27.0	1,913	1,913

Unit Specifications

Qty	Weight (lb)	Unit Installation	Unit ETL Listing
1	999 (+/- 5%)	Outdoor	UL 1812

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	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	98.0	80.0	81.6	70.2	75.0	62.5/50	91.2	73.9	80,920.0
Winter	27.0	22.7	56.4	44.3	70.0	54.3/35	39.7	35.5	61,248.0

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	1,913	0.5	1.211	1483	2	Plenum	Direct
Exhaust	1,913	0.5	1.162	1440	2	Plenum	Direct

Motor Specifications

Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	2	0.37	1	ODP	PE	1750
Exhaust	2	0.34	1	ODP	PE	1750

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	14.7	15.0	0.556

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

Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Outdoor	Std
Outdoor Air Filters - 2" MERV 8, 3-20x20	Std
Exhaust Air Filters - 2" MERV 8, 3-20x20	Std
Energy Recovery Device - Polymer Membrane Energy Recovery Core	Std
Unit Construction - Double Wall	X
Insulation - 1 inch R4 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Access - Hinged	X
Factory Wired Non-Fused Disconnect Switch	Std
Unit Finish - Galvanized	Std
Single Point Power	Std
Supply Weatherhood: Downturn	Std
Exhaust Weatherhood: Downturn	Std
Fan VFDs - Modulating	X
Fan Vibration Isolation - Neoprene	Std
Controls	
Unit Controls - Terminal Strip	X
Sensors	
Unit On/Off Control - By Others	X
Sensor Monitoring Package	
Heating Enable - None	
Cooling Enable - None	
Supply Fan Control	
Exhaust Fan Control	
Network Protocol	
Exhaust Only Operation	
Economizer Control	
Remote Panel	
Control Accessories	
Remote Display	
CO2 Sensor	
Dirty Filter Sensor(s)	
Airflow Monitoring - None	

Accessories	
Frost Control	
Spare Filters	
Shipped Loose Smoke Detectors	
Duct Flange	
Outdoor Air Damper - Low Leakage	X
Return Air Damper - Low Leakage	X
Service Outlet - 120 VAC GFCI Service Outlet, Shipped Loose	
Damper End Switch	
Roof Curb - GKD - 57.1/55.8-G14	X
Spare Fan Belts	
Warranty Options	
Unit Warranty - 18 Months (Std.)	Std
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

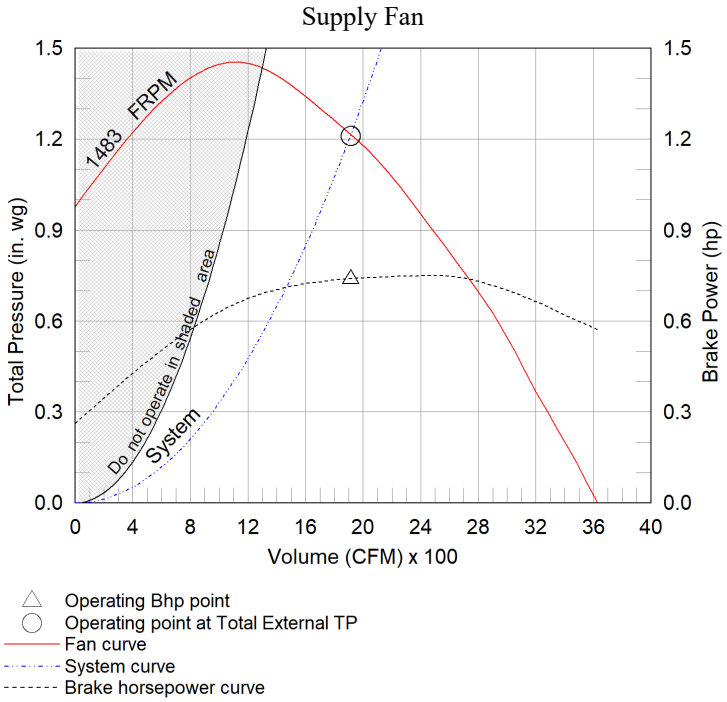
Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A
Return Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

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
1,913	0.5	1.211	1483	0.37	2	1	2	Plenum	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.086	0.061	0.01	0.5	1.211

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
76.4	80.7	73.2	77.5	70.5	65.4	62.2	69.8	77.8	66.3	15.7



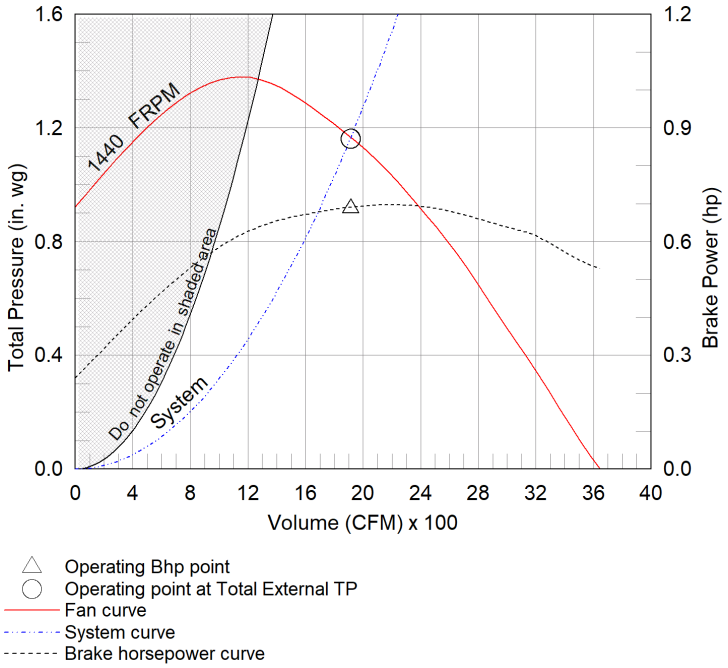
Exhaust Fan Charts And Performance

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
1,913	0.5	1.162	1440	0.34	2	1	2	Plenum	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.038	0.061	0.008	0.5	1.162

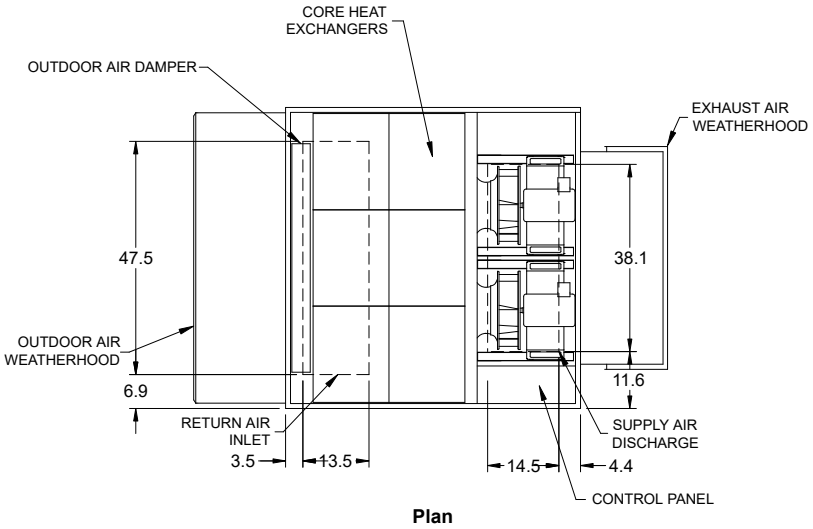
Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
74.4	77.3	70.7	68.2	55.9	53	47.9	57.6	68.9	57.4	8.7

Exhaust Fan



Radiated Sound

Position A



Plan

Position D

Position B

Position C

"E" is the Top Plane

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	80	76	77	73	75	72	70	65	84	79
B	80	77	77	75	79	77	74	70	86	83
C	80	76	78	73	74	72	69	65	84	79
D	79	76	76	68	65	65	62	58	82	73
E	78	72	76	71	72	70	68	63	82	77
Total	86	83	84	79	82	80	77	73	91	86

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

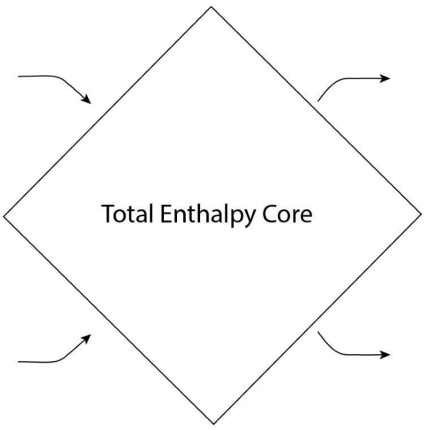
Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
1,913	60.6	1,913	60.2

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
132,571.0	11.05	51,651.0	4.30	6.74

Outdoor Air Entering	
Dry Bulb (F)	98.0
Wet Bulb (F)	80.0
Specific Humidity (gr/lb)	127
Enthalpy (BTU/lb)	43.6

Indoor Air Leaving	
Dry Bulb (F)	75.0
Wet Bulb (F)	62.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	28.2



Exhaust Air Leaving	
Dry Bulb (F)	91.2
Wet Bulb (F)	73.9
Specific Humidity (gr/lb)	98
Enthalpy (BTU/lb)	37.2

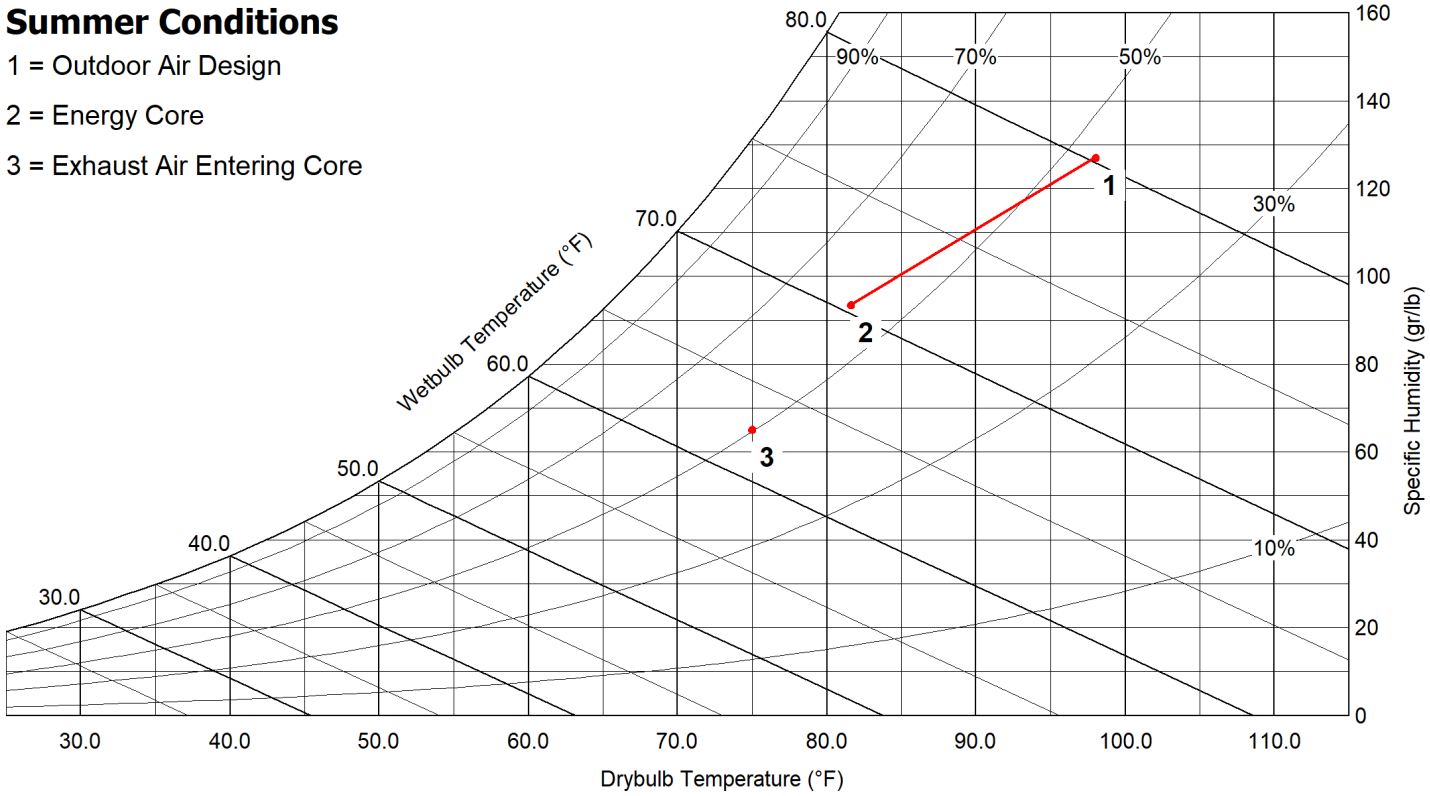
Supply Air Leaving	
Dry Bulb (F)	81.6
Wet Bulb (F)	70.2
Specific Humidity (gr/lb)	94
Enthalpy (BTU/lb)	34.2

Summer Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



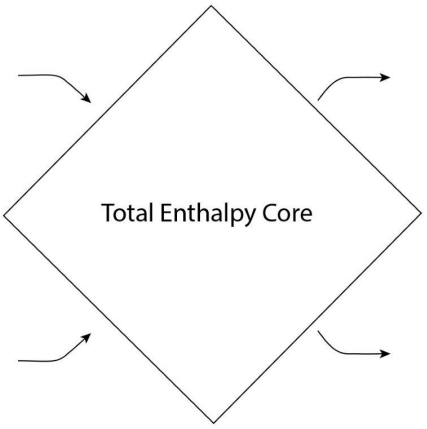
Energy Recovery Winter Performance

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Core Effectiveness**
1,913	62.5	1,913	64.4

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	**OA Load with Energy Recovery (BTU/h)**	**Equipment Reduction (BTU/h)**	**Sensible Effectiveness (%)**
89,580.0	28,332.0	61,248.0	68.3

Outdoor Air Entering	
Dry Bulb (F)	27.0
Wet Bulb (F)	22.7
Specific Humidity (gr/lb)	11
Enthalpy (BTU/lb)	8.1

Indoor Air Leaving	
Dry Bulb (F)	70.0
Rel. Humidity (%)	35
Specific Humidity (gr/lb)	38
Enthalpy (BTU/lb)	22.8



Exhaust Air Leaving	
Dry Bulb (F)	39.7
Wet Bulb (F)	35.5
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	13.2

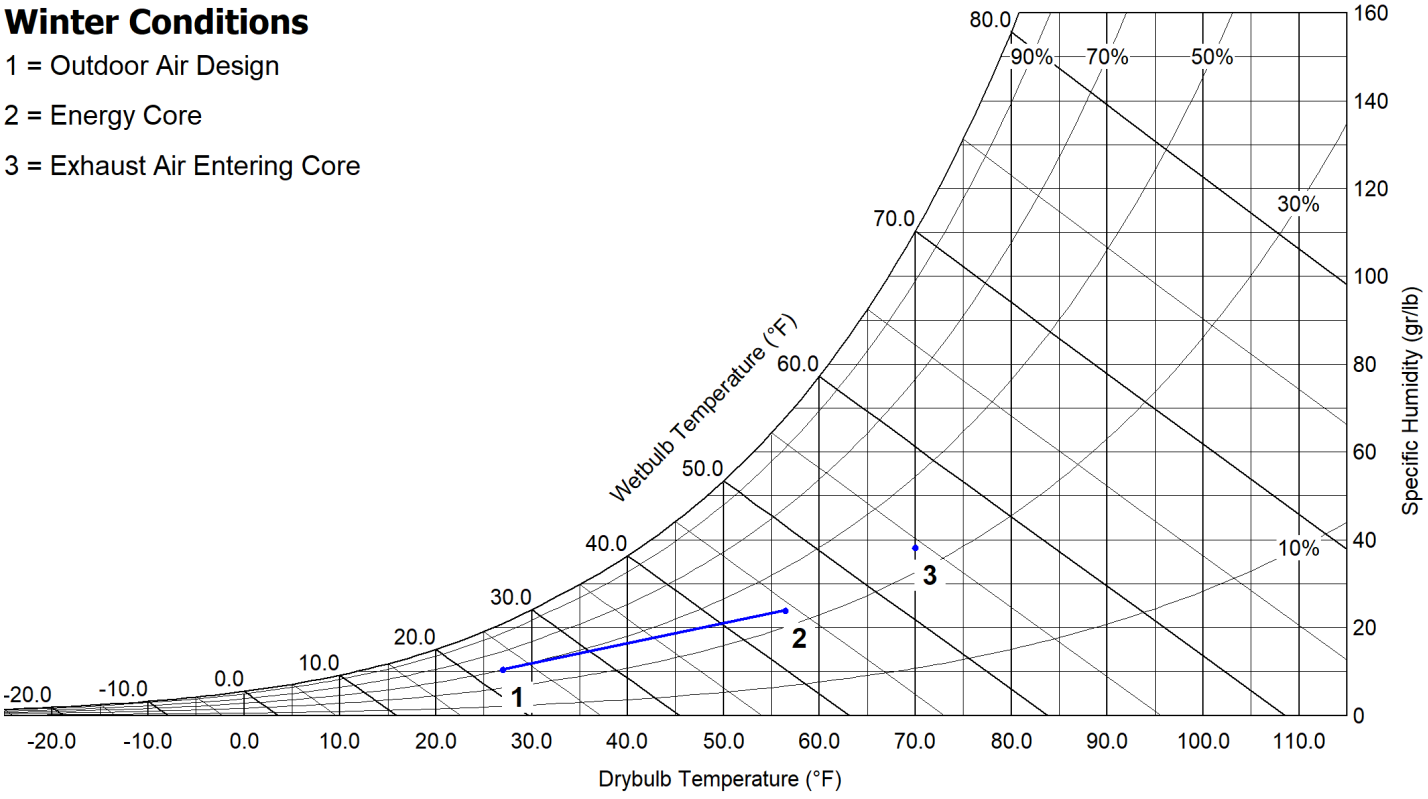
Supply Air Leaving	
Dry Bulb (F)	56.4
Wet Bulb (F)	44.3
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	17.3

Winter Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



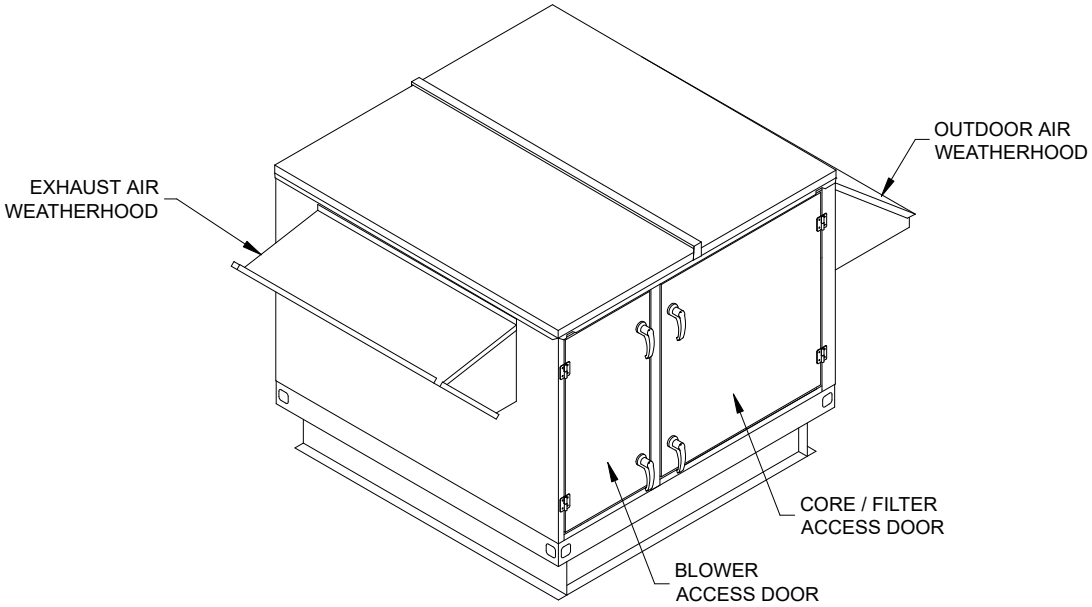
AHRI Performance Ratings

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
1915	1915	1913	0.1	1.05	0.56	0.56

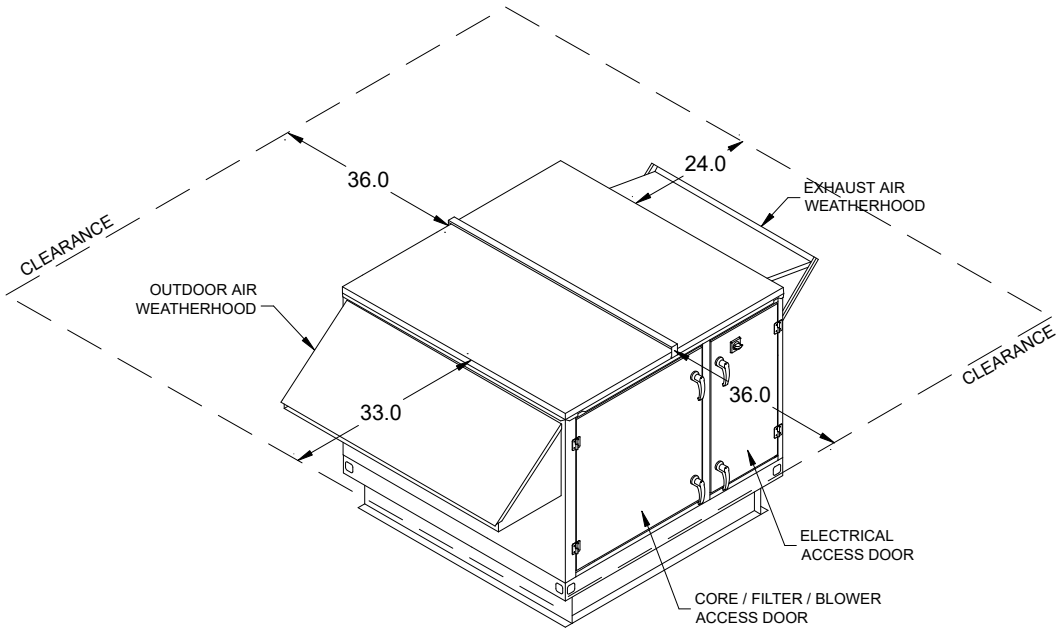
Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
60.6	62.5	71.5	68.3	53.3	49.1	60.2	64.4

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.

Isometric Drawings



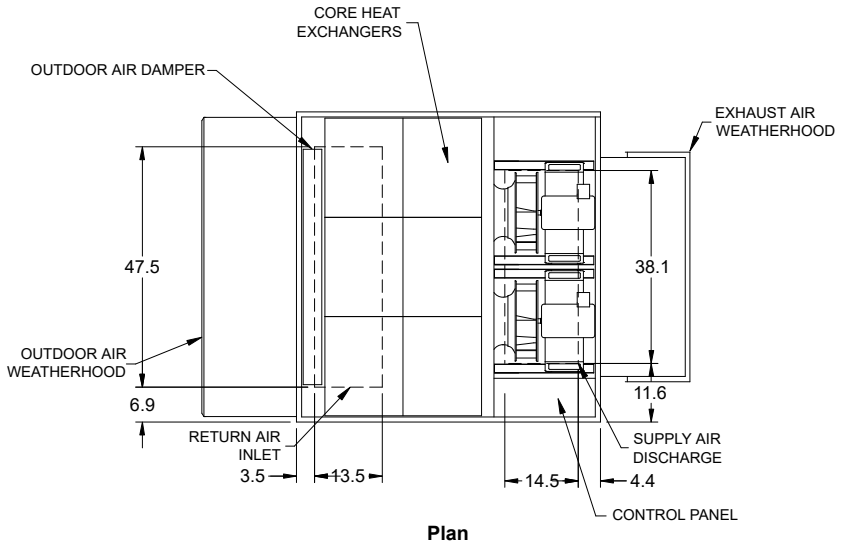
Back Right Isometric



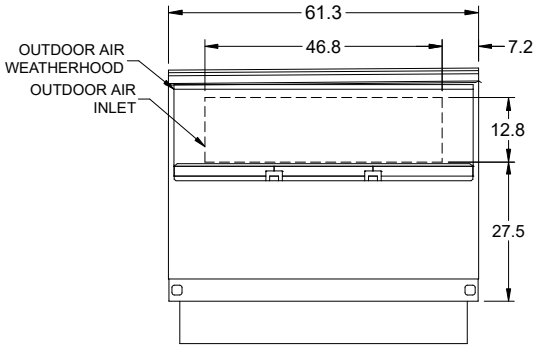
THE NON-ELECTRICAL SIDE CAN BE PLACED AGAINST A WALL. CLEARANCE TO THE ELECTRICAL SIDE IS ESSENTIAL TO PROVIDE ACCESS TO THE CONTROL CENTER AND COMPONENT MAINTENANCE.

Front Left Isometric

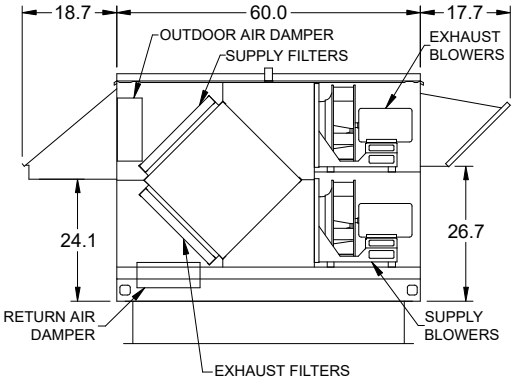
Overview Drawings



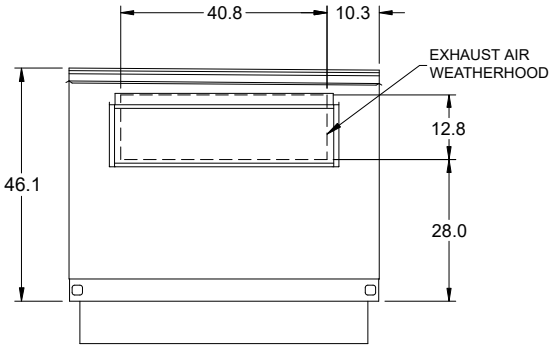
Plan



Left End

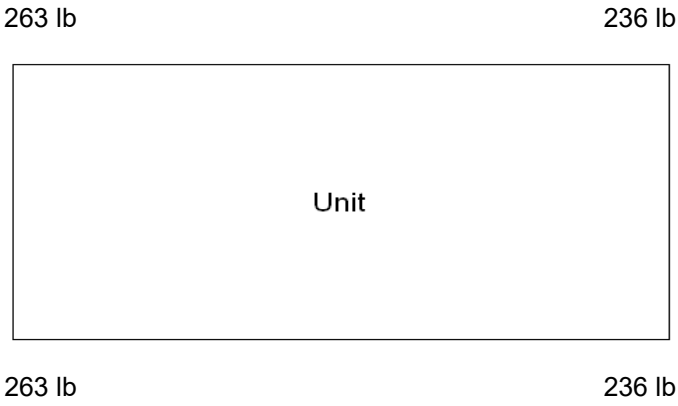


Elevation



Right End

Corner Weights



Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the left. Weights are applied at the base of the unit. Images not drawn to scale.

Terminal Strip Controls

BASIC UNIT CONTROLS:

The Energy Recovery Unit will be provided from the factory with an integral control center including: a single non-fused disconnect, 24 VAC transformer, terminal strip and fan VFDs.

ON/OFF CONTROL:

Within the unit control center, a digital signal must be field wired into the terminal strip (connecting terminals R and G) to control unit startup or shutdown.

This on/off signal is coming from:
By Others: The unit shall be energized by a field supplied and wired digital contact.

Startup (Digital Contact Closes)

- Factory mounted and wired outdoor air damper actuator is powered.
- Factory mounted and wired exhaust air damper actuator is powered.
- Exhaust fan ON.
- Supply fan ON.

Shutdown (Digital Contact Opens)

- Supply and exhaust fan de-energized.
- Outside air damper actuator de-energized, damper spring-return closed.
- Exhaust air damper actuator de-energized, damper spring-return closed.

CONTROL ACCESSORIES

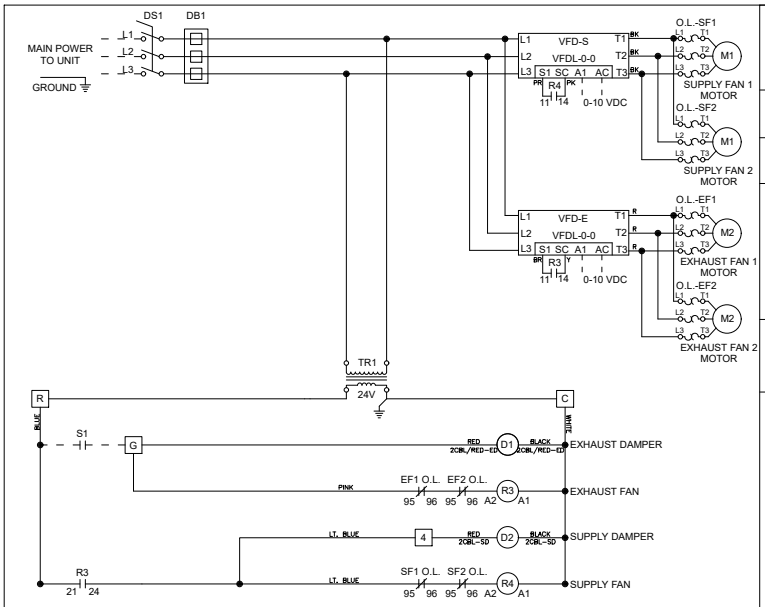
Supply Blower VFD – 0-10 VDC by others:

The supply blower will be provided with a factory mounted variable frequency drive. The supply blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Exhaust Blower VFD – 0-10 VDC by others:

The exhaust blower will be provided with a factory mounted variable frequency drive. The exhaust blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G3QCC1000CXXXXXE34

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D#	DAMPER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
M#	MOTOR
R1	ENERGY WHEEL CONTACTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
S1	FAN SWITCH
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Template Drawing: E34 DOC NUMBER: 3677963 REV: ----

Warranty Statement for ERV Preconditioners

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 18 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.

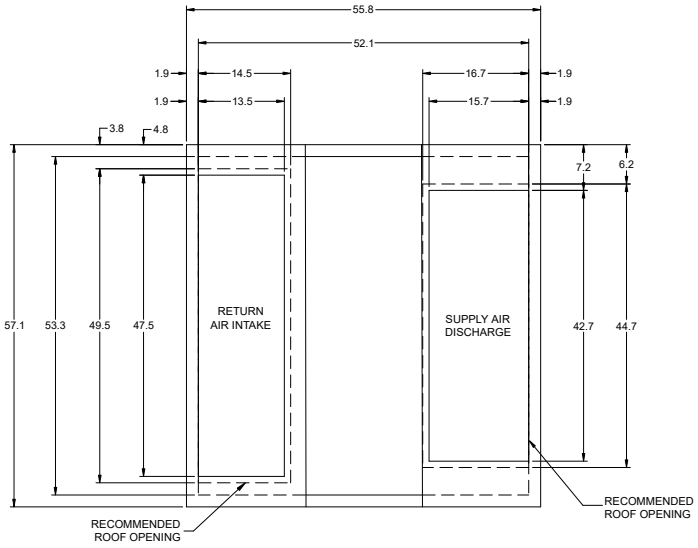
GKD Roof Curb

Model: GKD-57.1/55.8-G14

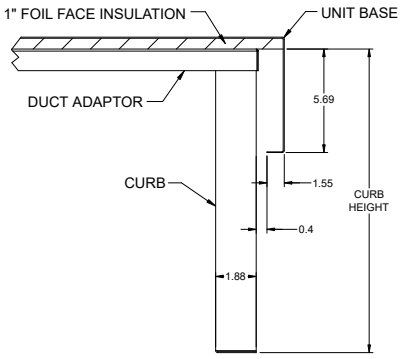
Curb Height (in.)	Curb Length (in.)	Curb Width (in.)	Material	Finish Type	Duct Adapter	Curb Weight (lb)
14	55.8	57.1	Galvanized	Galvanized	Yes	105

Standard Construction Features:
All dimensions shown in inches.
Weight shown is within +/-5%.
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.
18 gauge galvanized steel (perimeter channels).
18 gauge galvanized steel (interior channels).
Ships knocked down for field assembly.
Curb insulation to be provided by others.

Top View of Curb



Cross-Section View of Unit on Curb



ECV-20-P-H

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
105	98.0	80.0	27.0	1,173	1,173

Unit Specifications

Qty	Weight (lb)	Unit Installation	Unit ETL Listing
1	698 (+/- 5%)	Outdoor	UL 1812

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	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	98.0	80.0	81.3	70.0	75.0	62.5/50	91.5	74.1	50,674.0
Winter	27.0	22.7	57.0	44.7	70.0	54.3/35	39.1	35.0	38,322.0

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	1,173	0.5	1.136	1454	1	Plenum	Direct
Exhaust	1,173	0.5	1.084	1538	1	Plenum	Direct

Motor Specifications

Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	0.37	3/4	ODP	SE	1750
Exhaust	1	0.42	3/4	ODP	SE	1750

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	5.7	15.0	0.501

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

Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Outdoor	Std
Outdoor Air Filters - 2" MERV 8, 2-20x20	Std
Exhaust Air Filters - 2" MERV 8, 2-20X20	Std
Energy Recovery Device - Polymer Membrane Energy Recovery Core	Std
Unit Construction - Double Wall	X
Insulation - 1 inch R4 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Access - Hinged	X
Factory Wired Non-Fused Disconnect Switch	Std
Unit Finish - Galvanized	Std
Single Point Power	Std
Supply Weatherhood: Downturn	Std
Exhaust Weatherhood: Downturn	Std
Fan VFDs - Modulating	X
Fan Vibration Isolation - Neoprene	Std
Controls	
Unit Controls - Terminal Strip	X
Sensors	
Unit On/Off Control - By Others	X
Sensor Monitoring Package	
Heating Enable - None	
Cooling Enable - None	
Supply Fan Control	
Exhaust Fan Control	
Network Protocol	
Exhaust Only Operation	
Economizer Control	
Remote Panel	
Control Accessories	
Remote Display	
CO2 Sensor	
Dirty Filter Sensor(s)	
Airflow Monitoring - None	

Accessories	
Frost Control	
Spare Filters	
Shipped Loose Smoke Detectors	
Duct Flange	
Outdoor Air Damper - Low Leakage	X
Return Air Damper - Low Leakage	X
Service Outlet - 120 VAC GFCI Service Outlet, Shipped Loose	
Damper End Switch	
Roof Curb - GKD - 39.6/55.8-G14	X
Spare Fan Belts	
Warranty Options	
Unit Warranty - 18 Months (Std.)	Std
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A
Return Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

Supply Fan Charts And Performance

Supply Fan Performance

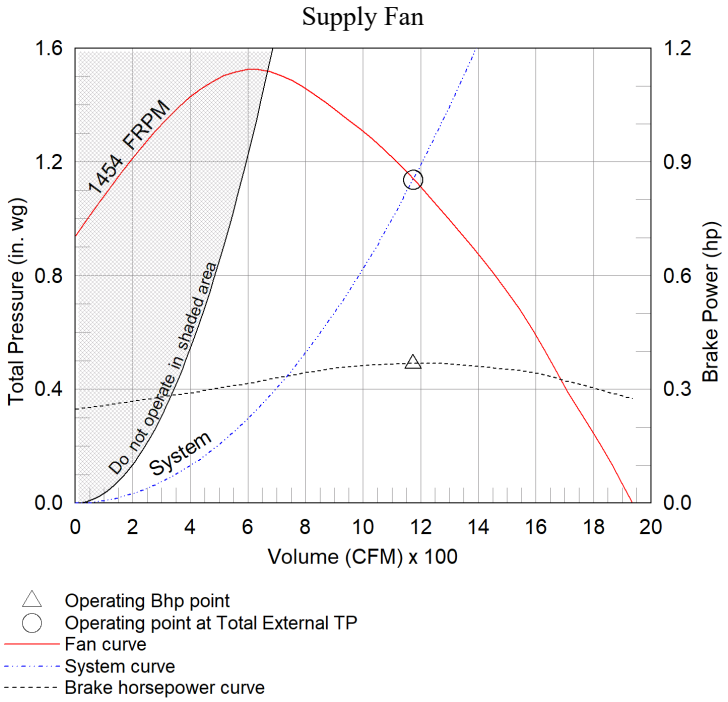
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
1,173	0.5	1.136	1454	0.37	1	3/4	1	Plenum	Direct

Pressure Drop (in. wg)

Weatherhood	Filter	Damper	External	Total
0.065	0.052	0.01	0.5	1.136

Sound Performance in Accordance with AMCA

Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
78.8	78.4	73.1	70.2	65.1	61.2	59.4	65.8	72.9	61.4	12.7



Exhaust Fan Charts And Performance

Exhaust Fan Performance

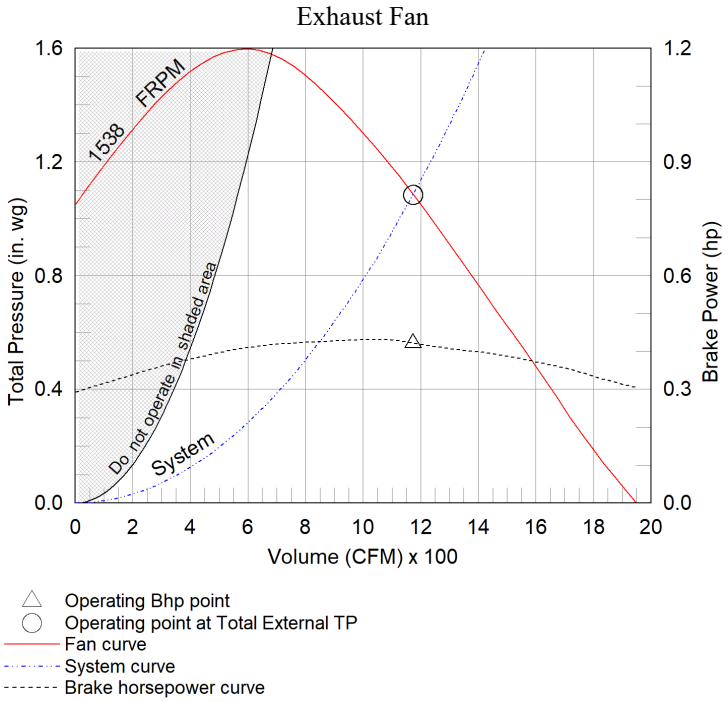
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
1,173	0.5	1.084	1538	0.42	1	3/4	1	Plenum	Direct

Pressure Drop (in. wg)

Weatherhood	Filter	Damper	External	Total
0.014	0.052	0.01	0.5	1.084

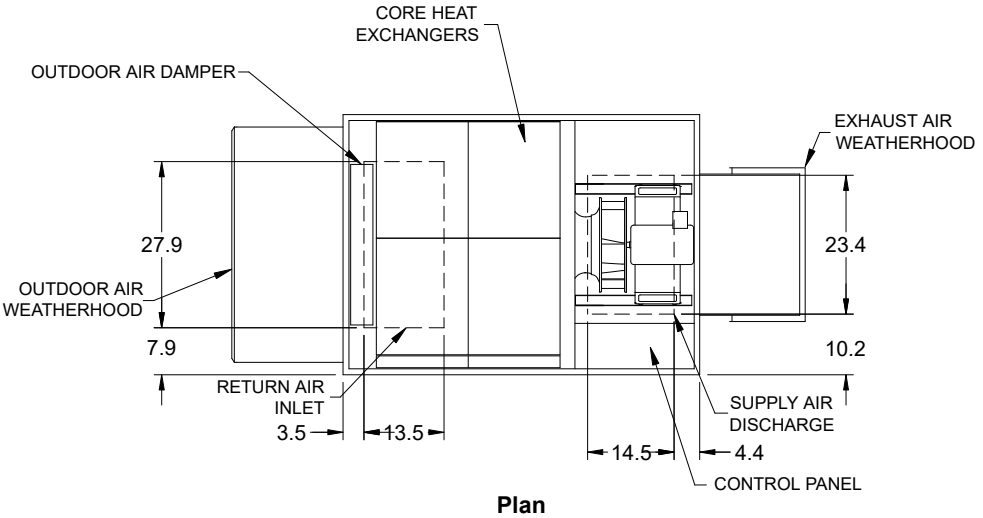
Sound Performance in Accordance with AMCA

Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
73.4	69.9	67.7	61.2	53	50.5	49.3	42.2	63.6	52.1	6.3



Radiated Sound

Position A



Position D

Position B

Plan

Position C

"E" is the Top Plane

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	78	75	71	70	70	70	68	64	82	76
B	79	76	73	72	76	75	73	69	84	81
C	78	75	70	70	70	69	68	64	81	76
D	75	70	67	64	61	60	56	50	77	67
E	76	70	71	69	68	68	67	63	80	75
Total	85	81	78	76	78	77	76	72	88	84

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

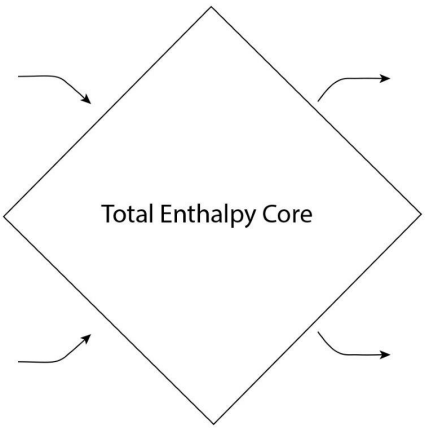
Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
1,173	62	1,173	61.6

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
81,289.0	6.77	30,615.0	2.55	4.22

Outdoor Air Entering	
Dry Bulb (F)	98.0
Wet Bulb (F)	80.0
Specific Humidity (gr/lb)	127
Enthalpy (BTU/lb)	43.6

Indoor Air Leaving	
Dry Bulb (F)	75.0
Wet Bulb (F)	62.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	28.2



Exhaust Air Leaving	
Dry Bulb (F)	91.5
Wet Bulb (F)	74.1
Specific Humidity (gr/lb)	99
Enthalpy (BTU/lb)	37.5

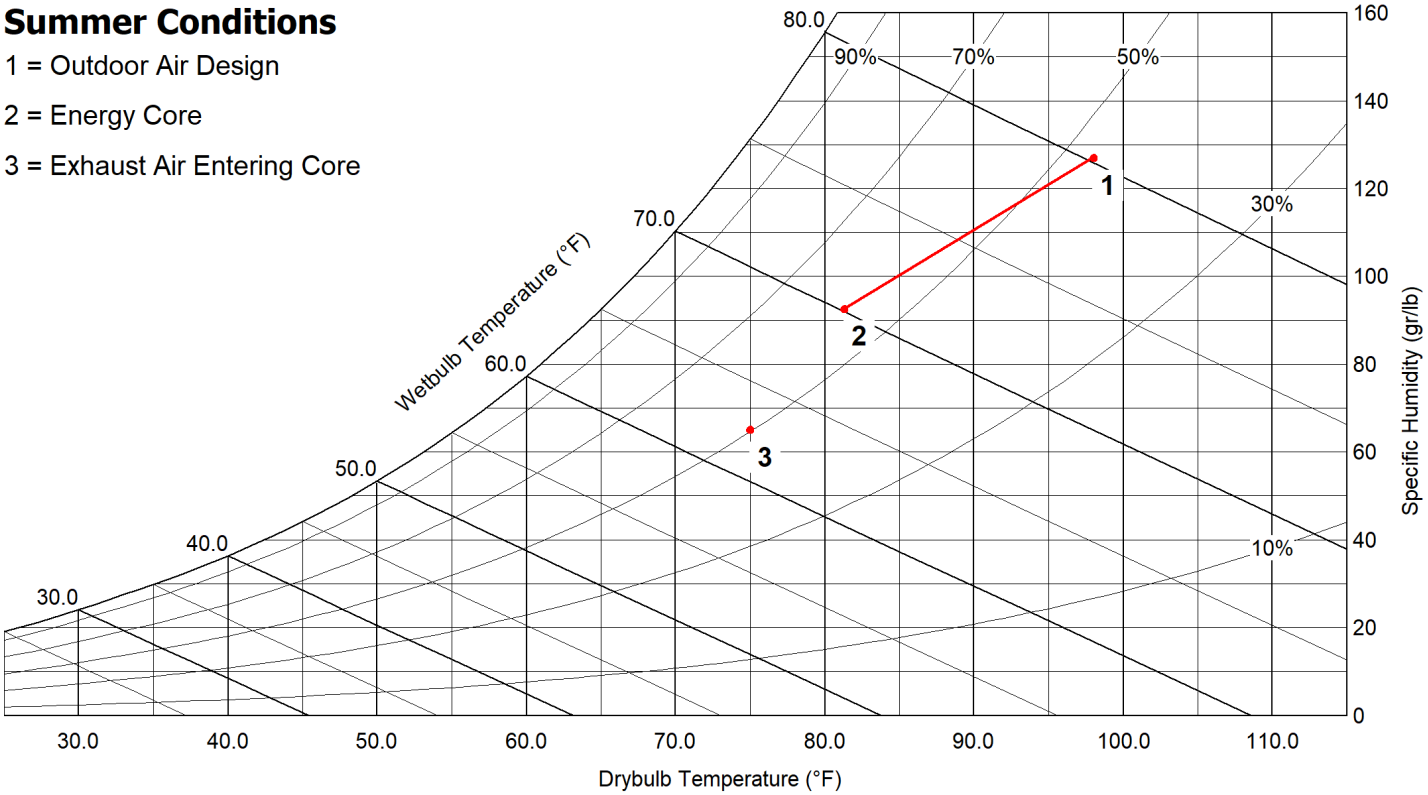
Supply Air Leaving	
Dry Bulb (F)	81.3
Wet Bulb (F)	70.0
Specific Humidity (gr/lb)	93
Enthalpy (BTU/lb)	34.0

Summer Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



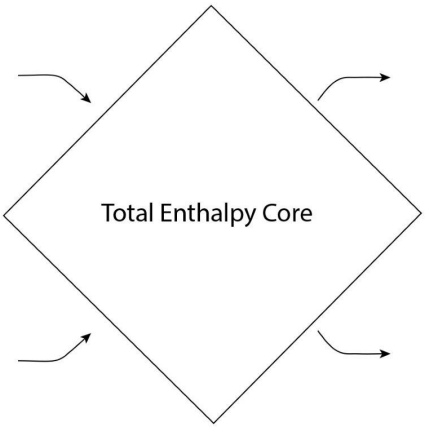
Energy Recovery Winter Performance

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Core Effectiveness**
1,173	64	1,173	65.8

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	**OA Load with Energy Recovery (BTU/h)**	**Equipment Reduction (BTU/h)**	**Sensible Effectiveness (%)**
54,928.0	16,606.0	38,322.0	69.7

Outdoor Air Entering	
Dry Bulb (F)	27.0
Wet Bulb (F)	22.7
Specific Humidity (gr/lb)	11
Enthalpy (BTU/lb)	8.1

Indoor Air Leaving	
Dry Bulb (F)	70.0
Rel. Humidity (%)	35
Specific Humidity (gr/lb)	38
Enthalpy (BTU/lb)	22.8



Exhaust Air Leaving	
Dry Bulb (F)	39.1
Wet Bulb (F)	35.0
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	13.0

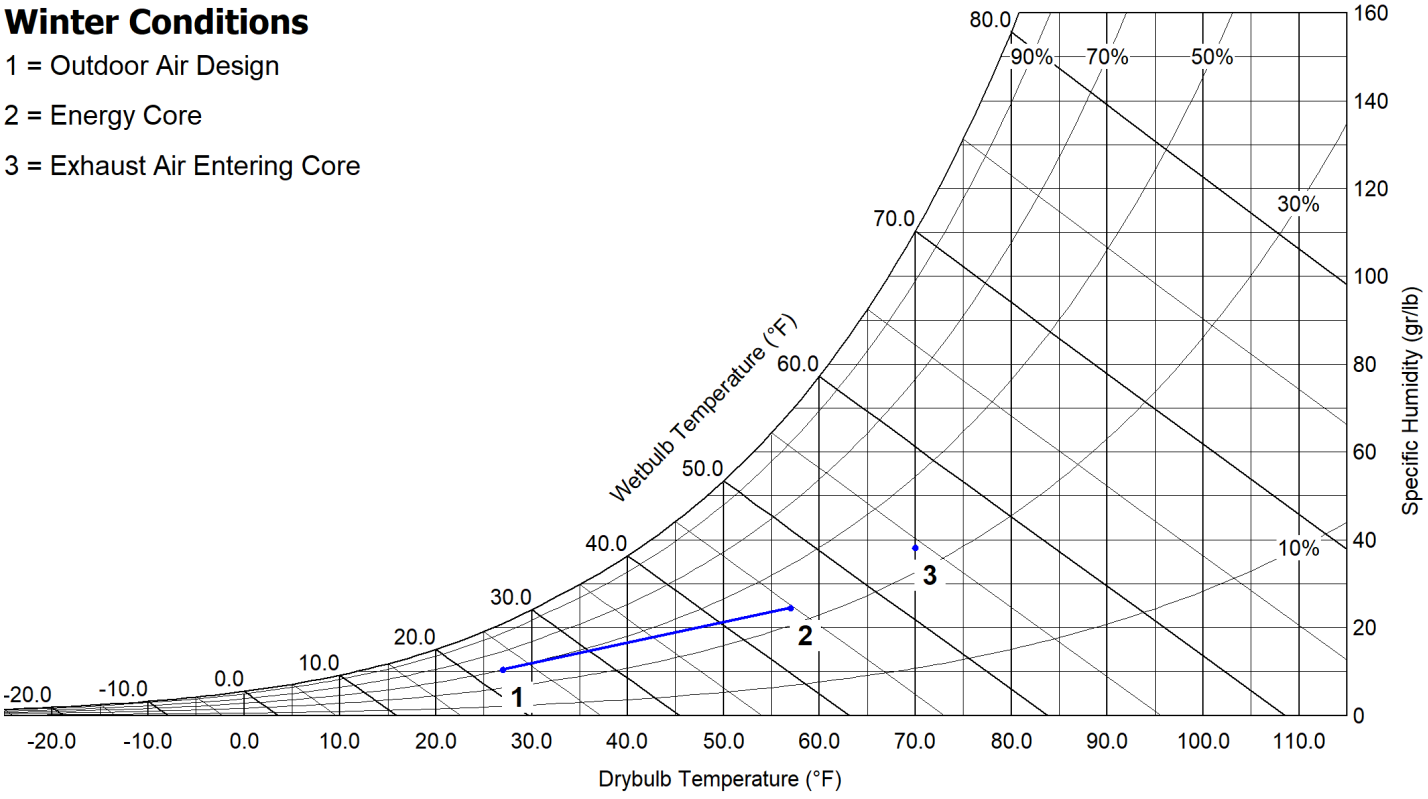
Supply Air Leaving	
Dry Bulb (F)	57.0
Wet Bulb (F)	44.7
Specific Humidity (gr/lb)	25
Enthalpy (BTU/lb)	17.5

Winter Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



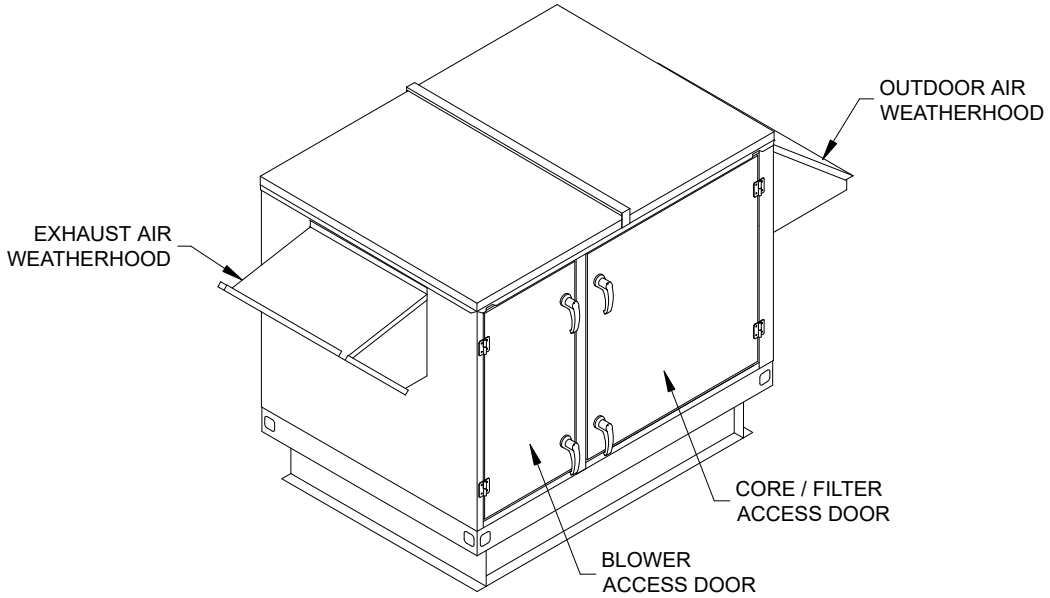
AHRI Performance Ratings

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
1174	1174	1173	0.1	1.06	0.51	0.51

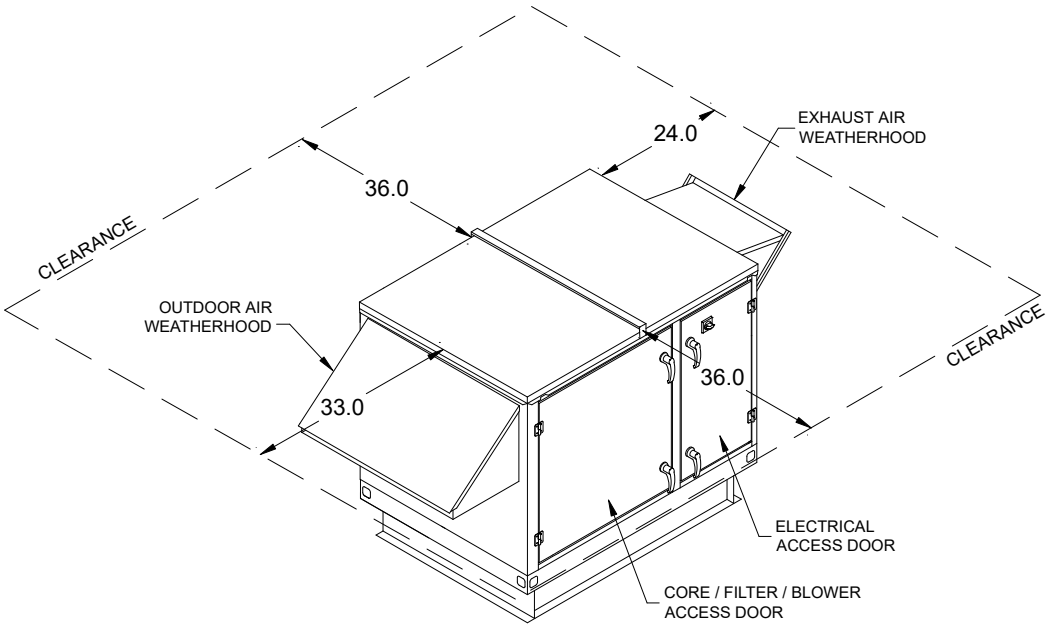
Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
62	64	72.6	69.7	54.8	50.9	61.6	65.8

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.

Isometric Drawings



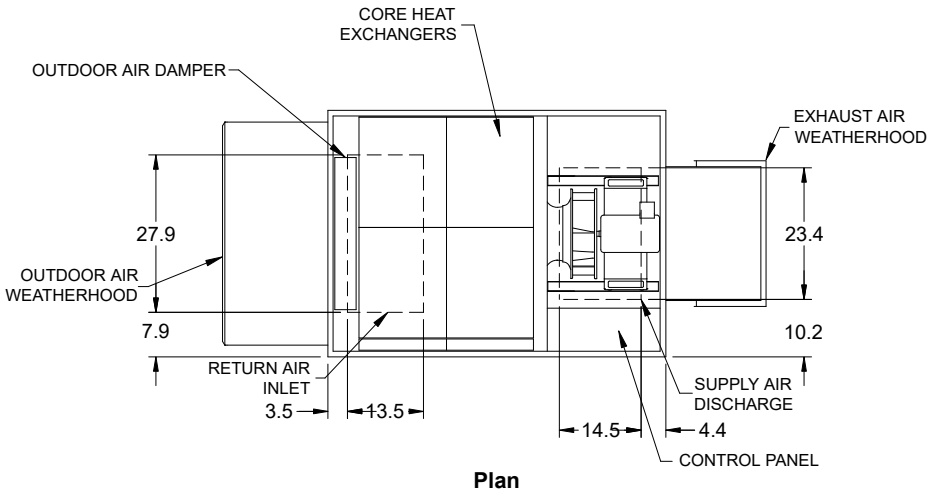
Back Right Isometric



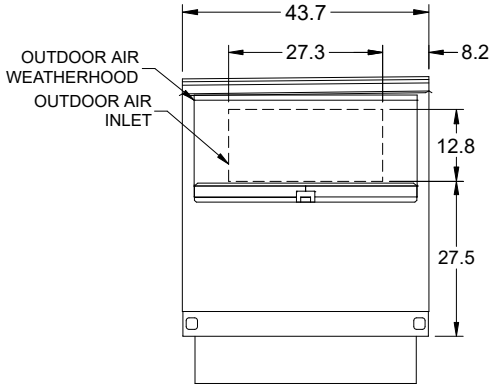
THE NON-ELECTRICAL SIDE CAN BE PLACED AGAINST A WALL. CLEARANCE TO THE ELECTRICAL SIDE IS ESSENTIAL TO PROVIDE ACCESS TO THE CONTROL CENTER AND COMPONENT MAINTENANCE.

Front Left Isometric

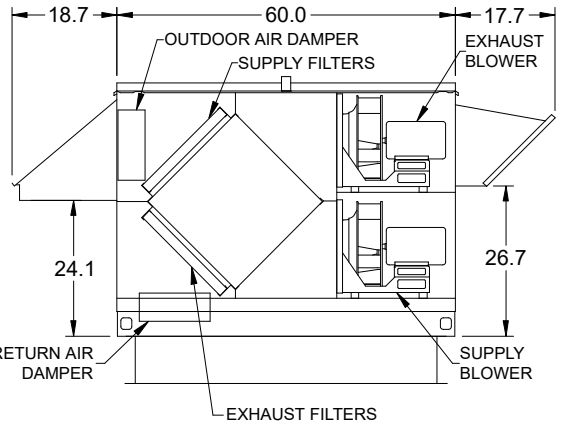
Overview Drawings



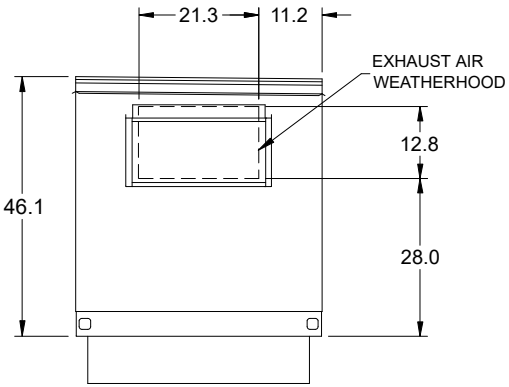
Plan



Left End

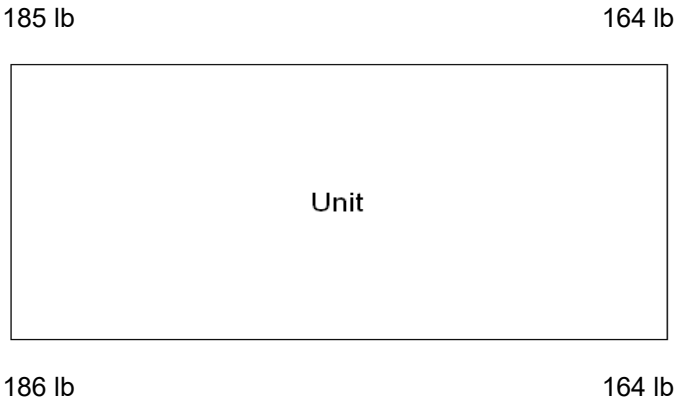


Elevation



Right End

Corner Weights



Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the left. Weights are applied at the base of the unit. Images not drawn to scale.

Terminal Strip Controls

BASIC UNIT CONTROLS:

The Energy Recovery Unit will be provided from the factory with an integral control center including: a single non-fused disconnect, 24 VAC transformer, terminal strip and fan VFDs.

ON/OFF CONTROL:

Within the unit control center, a digital signal must be field wired into the terminal strip (connecting terminals R and G) to control unit startup or shutdown.

This on/off signal is coming from:
By Others: The unit shall be energized by a field supplied and wired digital contact.

Startup (Digital Contact Closes)

- Factory mounted and wired outdoor air damper actuator is powered.
- Factory mounted and wired exhaust air damper actuator is powered.
- Exhaust fan ON.
- Supply fan ON.

Shutdown (Digital Contact Opens)

- Supply and exhaust fan de-energized.
- Outside air damper actuator de-energized, damper spring-return closed.
- Exhaust air damper actuator de-energized, damper spring-return closed.

CONTROL ACCESSORIES

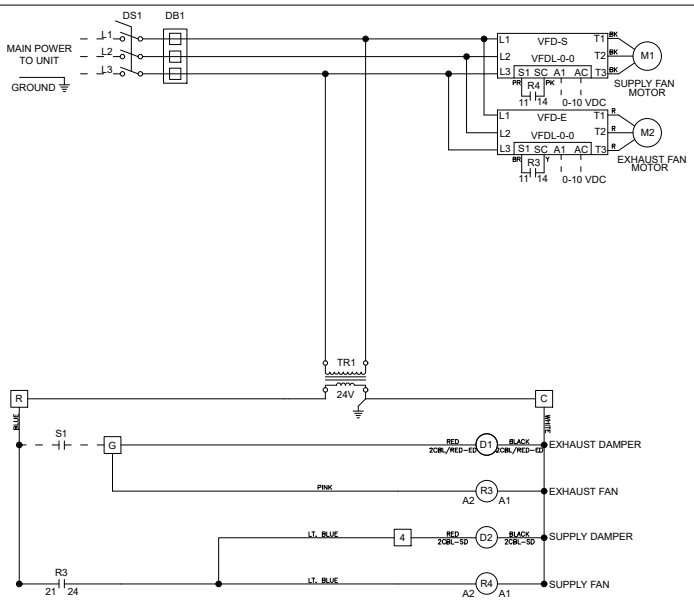
Supply Blower VFD – 0-10 VDC by others:

The supply blower will be provided with a factory mounted variable frequency drive. The supply blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Exhaust Blower VFD – 0-10 VDC by others:

The exhaust blower will be provided with a factory mounted variable frequency drive. The exhaust blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G3LCC1000CXXXXXE34

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D#	DAMPER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
M#	MOTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
S1	FAN SWITCH
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Template Drawing: E34 DOC NUMBER: 3687929 REV: ----

Warranty Statement for ERV Preconditioners

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 18 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.

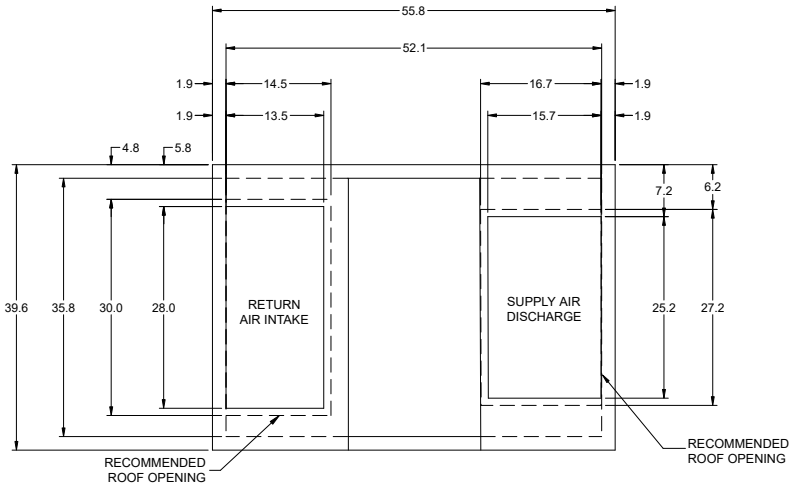
GKD Roof Curb

Model: GKD-39.6/55.8-G14

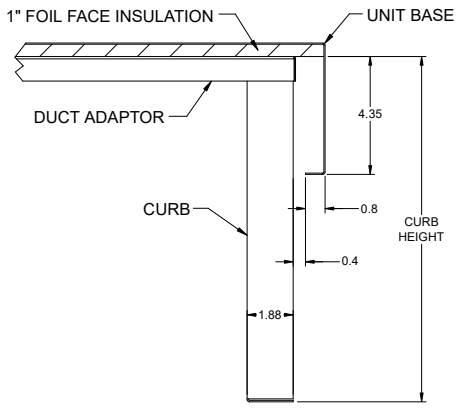
Curb Height (in.)	Curb Length (in.)	Curb Width (in.)	Material	Finish Type	Duct Adapter	Curb Weight (lb)
14	55.8	39.6	Galvanized	Galvanized	Yes	79

Standard Construction Features:
All dimensions shown in inches.
Weight shown is within +/-5%.
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.
18 gauge galvanized steel (perimeter channels).
18 gauge galvanized steel (interior channels).
Ships knocked down for field assembly.
Curb insulation to be provided by others.

Top View of Curb



Cross-Section View of Unit on Curb



ECV-20-P-H

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
105	98.0	80.0	27.0	1,343	1,343

Unit Specifications

Qty	Weight (lb)	Unit Installation	Unit ETL Listing
1	698 (+/- 5%)	Outdoor	UL 1812

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	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	98.0	80.0	81.7	70.4	75.0	62.5/50	91.0	73.7	55,600.0
Winter	27.0	22.7	56.0	44.0	70.0	54.3/35	40.0	35.8	42,414.0

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	1,343	0.5	1.253	1578	1	Plenum	Direct
Exhaust	1,343	0.5	1.185	1674	1	Plenum	Direct

Motor Specifications

Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	0.47	3/4	ODP	SE	1750
Exhaust	1	0.54	3/4	ODP	SE	1750

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	5.7	15.0	0.557

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

Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Outdoor	Std
Outdoor Air Filters - 2" MERV 8, 2-20x20	Std
Exhaust Air Filters - 2" MERV 8, 2-20X20	Std
Energy Recovery Device - Polymer Membrane Energy Recovery Core	Std
Unit Construction - Double Wall	X
Insulation - 1 inch R4 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Access - Hinged	X
Factory Wired Non-Fused Disconnect Switch	Std
Unit Finish - Galvanized	Std
Single Point Power	Std
Supply Weatherhood: Downturn	Std
Exhaust Weatherhood: Downturn	Std
Fan VFDs - Modulating	X
Fan Vibration Isolation - Neoprene	Std
Controls	
Unit Controls - Terminal Strip	X
Sensors	
Unit On/Off Control - By Others	X
Sensor Monitoring Package	
Heating Enable - None	
Cooling Enable - None	
Supply Fan Control	
Exhaust Fan Control	
Network Protocol	
Exhaust Only Operation	
Economizer Control	
Remote Panel	
Control Accessories	
Remote Display	
CO2 Sensor	
Dirty Filter Sensor(s)	
Airflow Monitoring - None	

Accessories	
Frost Control	
Spare Filters	
Shipped Loose Smoke Detectors	
Duct Flange	
Outdoor Air Damper - Low Leakage	X
Return Air Damper - Low Leakage	X
Service Outlet - 120 VAC GFCI Service Outlet, Shipped Loose	
Damper End Switch	
Roof Curb - GKD - 39.6/55.8-G14	X
Spare Fan Belts	
Warranty Options	
Unit Warranty - 18 Months (Std.)	Std
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

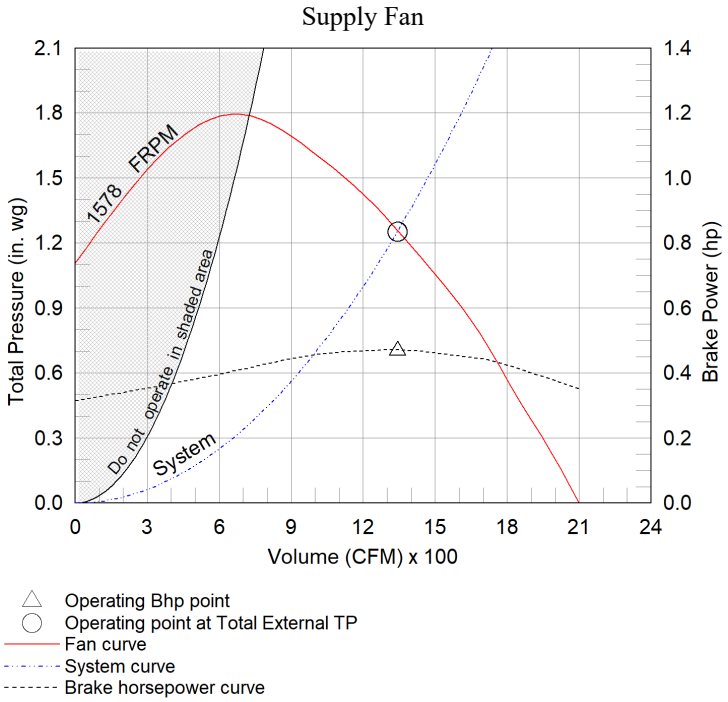
Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A
Return Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

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
1,343	0.5	1.253	1578	0.47	1	3/4	1	Plenum	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.086	0.068	0.01	0.5	1.253

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
78.9	77.5	79.1	71.3	66.9	62.8	60.9	66.6	75.1	63.6	14

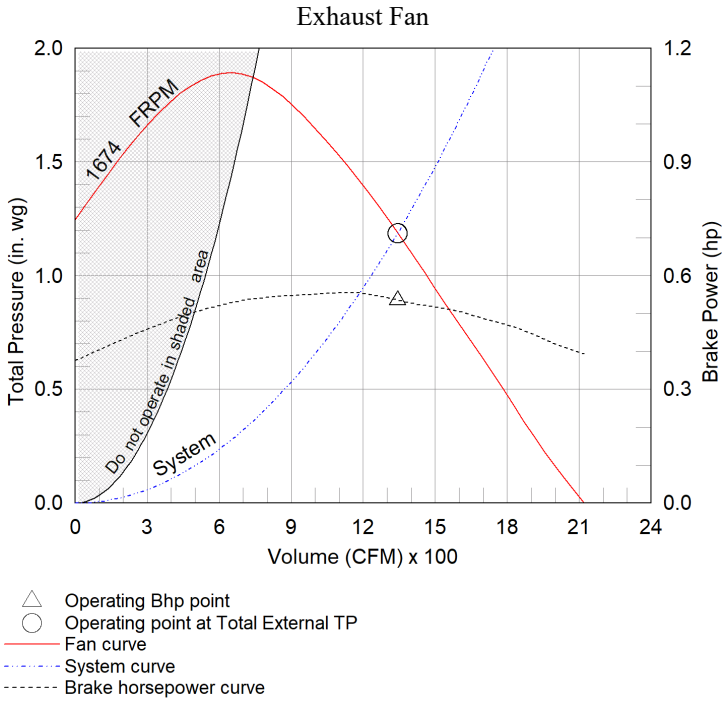


Exhaust Fan Charts And Performance

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
1,343	0.5	1.185	1674	0.54	1	3/4	1	Plenum	Direct

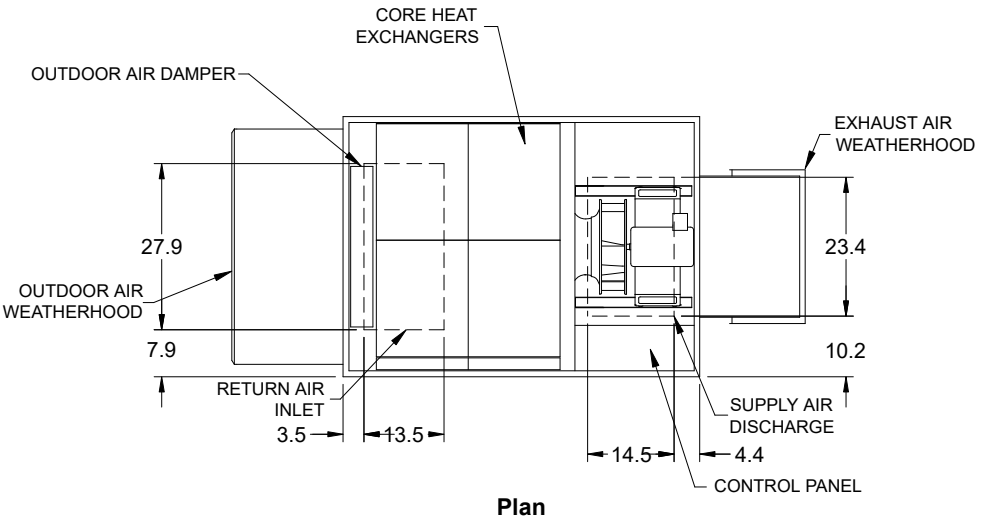
Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.018	0.068	0.013	0.5	1.185

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
72.5	70.3	73.1	63.2	55.1	52.1	50.7	45	67	55.5	7.6



Radiated Sound

Position A



Plan

Position D

Position B

Position C

"E" is the Top Plane

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	78	75	71	70	70	70	68	64	82	76
B	79	76	73	72	76	75	73	69	84	81
C	78	75	70	70	70	69	68	64	81	76
D	75	70	67	64	61	60	56	50	77	67
E	76	70	71	69	68	68	67	63	80	75
Total	85	81	78	76	78	77	76	72	88	84

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

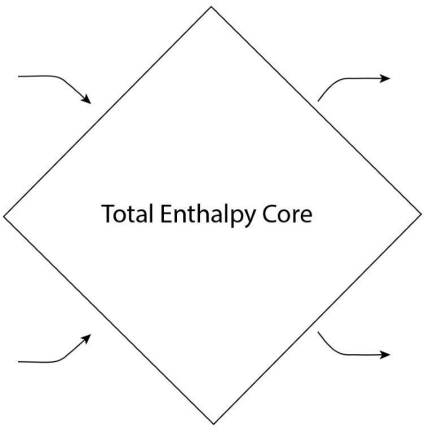
Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
1,343	59.7	1,343	59.3

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
93,070.0	7.76	37,470.0	3.12	4.63

Outdoor Air Entering	
Dry Bulb (F)	98.0
Wet Bulb (F)	80.0
Specific Humidity (gr/lb)	127
Enthalpy (BTU/lb)	43.6

Indoor Air Leaving	
Dry Bulb (F)	75.0
Wet Bulb (F)	62.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	28.2



Exhaust Air Leaving	
Dry Bulb (F)	91.0
Wet Bulb (F)	73.7
Specific Humidity (gr/lb)	97
Enthalpy (BTU/lb)	37.1

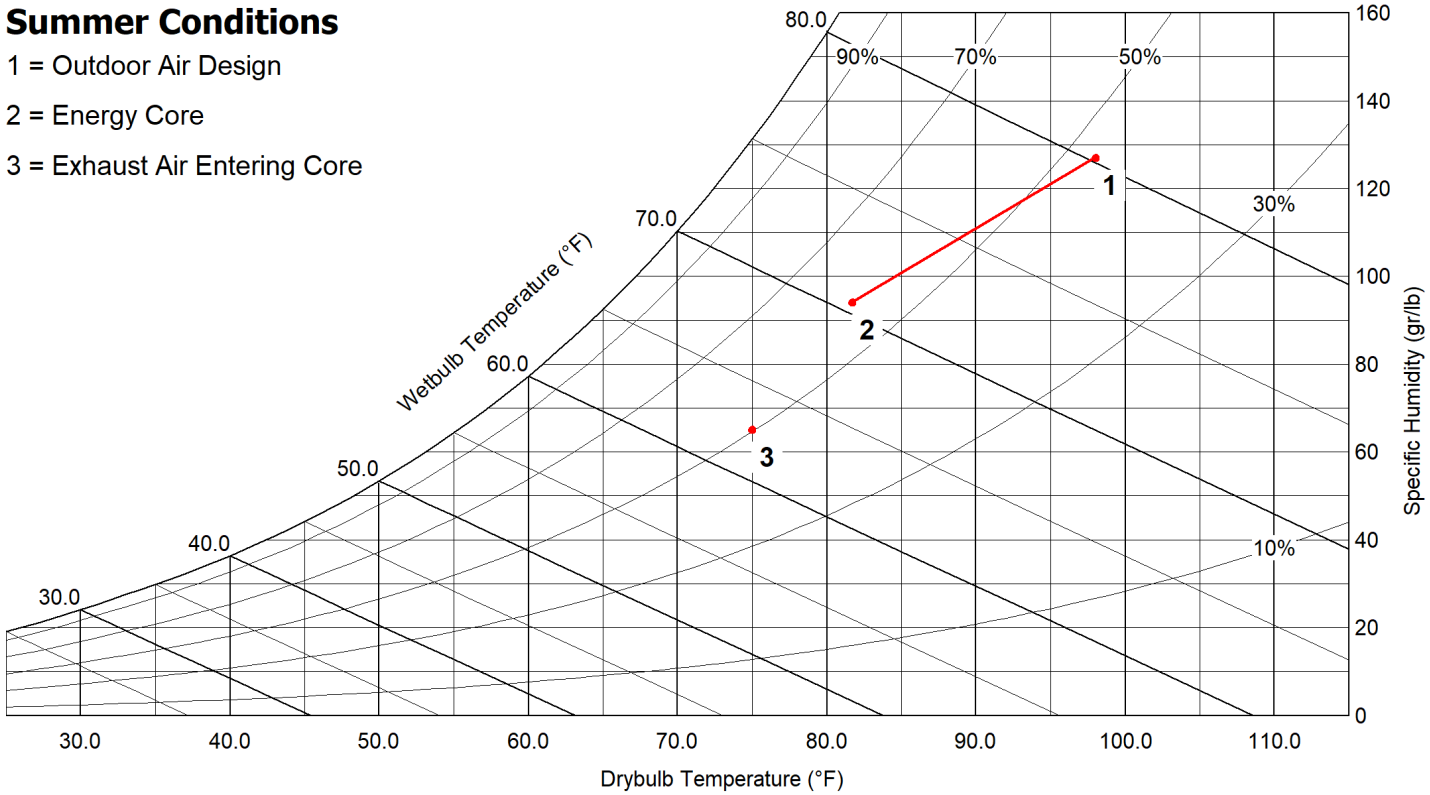
Supply Air Leaving	
Dry Bulb (F)	81.7
Wet Bulb (F)	70.4
Specific Humidity (gr/lb)	94
Enthalpy (BTU/lb)	34.4

Summer Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



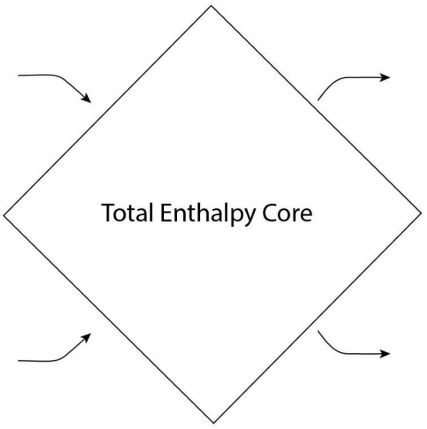
Energy Recovery Winter Performance

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Core Effectiveness**
1,343	61.5	1,343	63.4

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	**OA Load with Energy Recovery (BTU/h)**	**Equipment Reduction (BTU/h)**	**Sensible Effectiveness (%)**
62,889.0	20,475.0	42,414.0	67.4

Outdoor Air Entering	
Dry Bulb (F)	27.0
Wet Bulb (F)	22.7
Specific Humidity (gr/lb)	11
Enthalpy (BTU/lb)	8.1

Indoor Air Leaving	
Dry Bulb (F)	70.0
Rel. Humidity (%)	35
Specific Humidity (gr/lb)	38
Enthalpy (BTU/lb)	22.8



Exhaust Air Leaving	
Dry Bulb (F)	40.0
Wet Bulb (F)	35.8
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	13.4

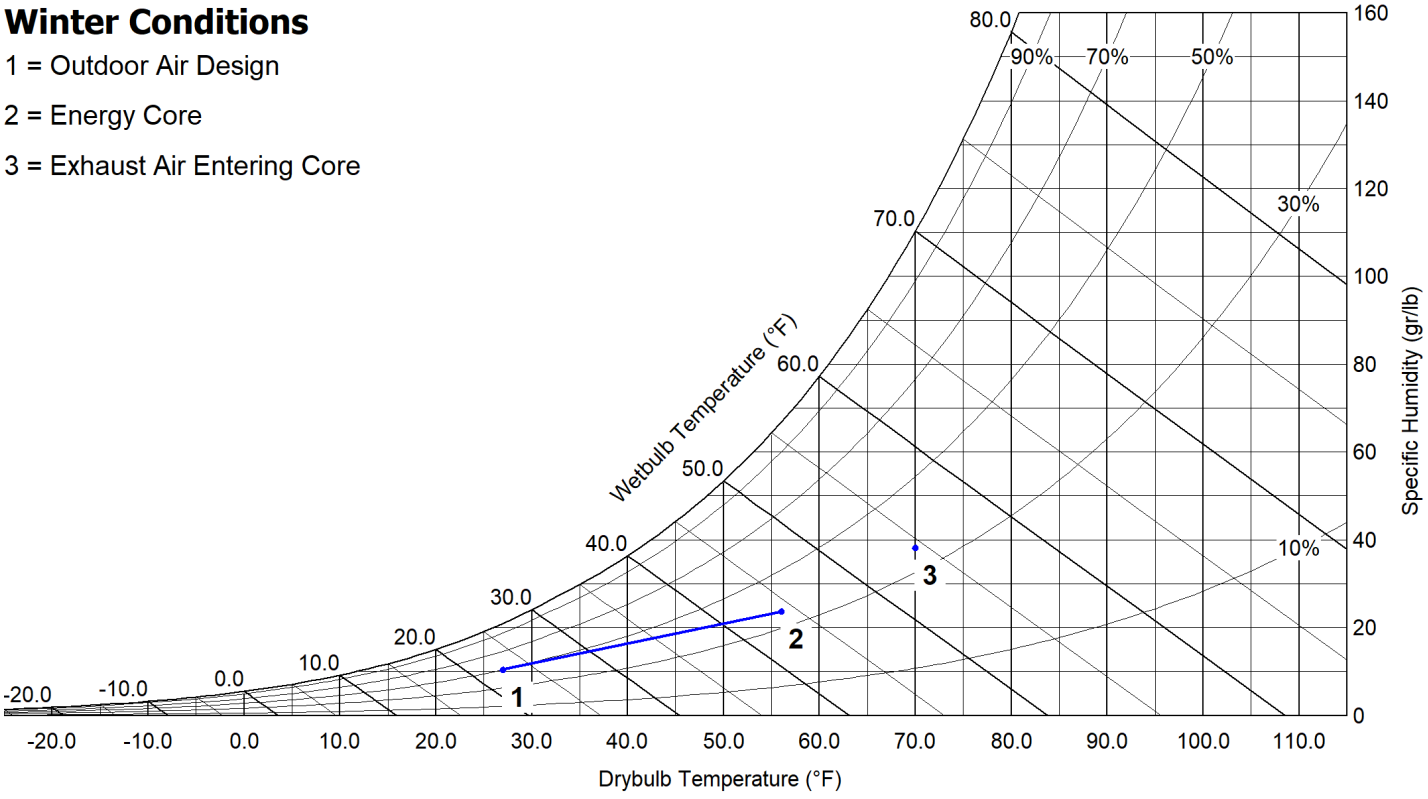
Supply Air Leaving	
Dry Bulb (F)	56.0
Wet Bulb (F)	44.0
Specific Humidity (gr/lb)	24
Enthalpy (BTU/lb)	17.1

Winter Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



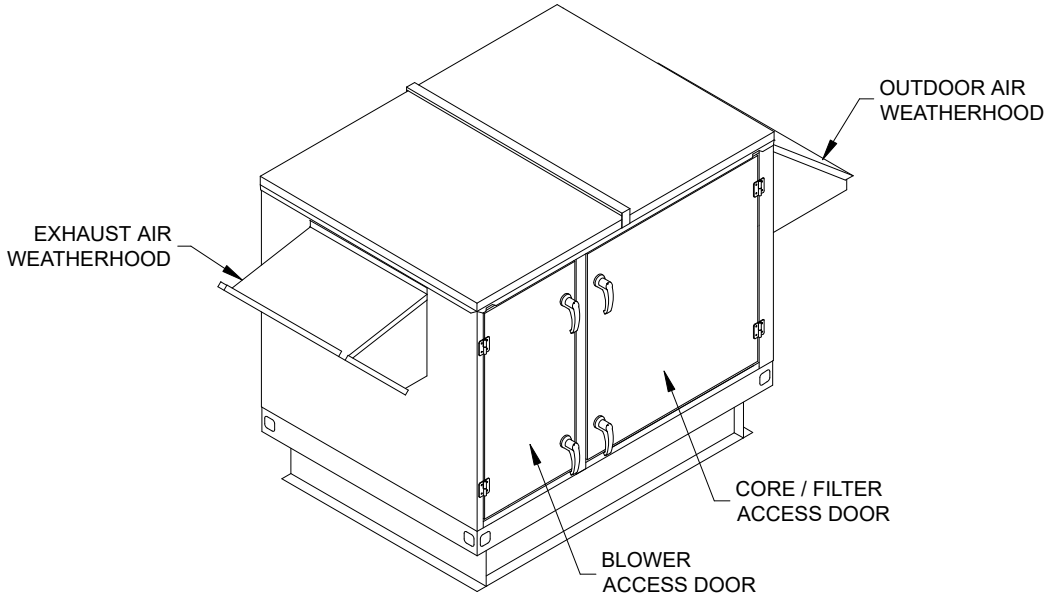
AHRI Performance Ratings

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
1345	1345	1343	0.1	1.05	0.59	0.59

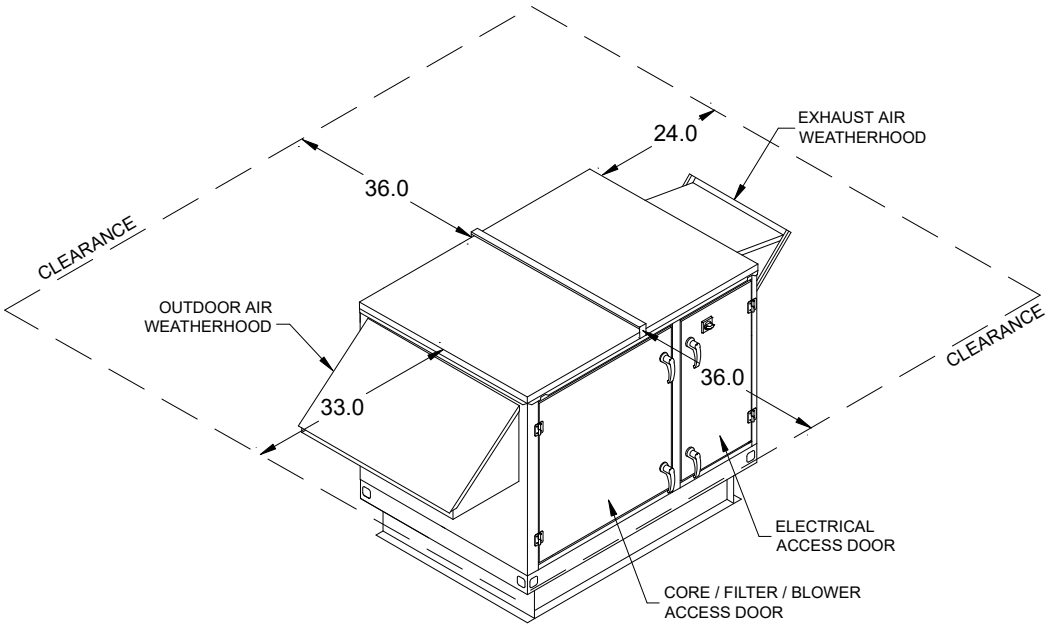
Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
59.7	61.5	70.7	67.4	52.4	47.9	59.3	63.4

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.

Isometric Drawings



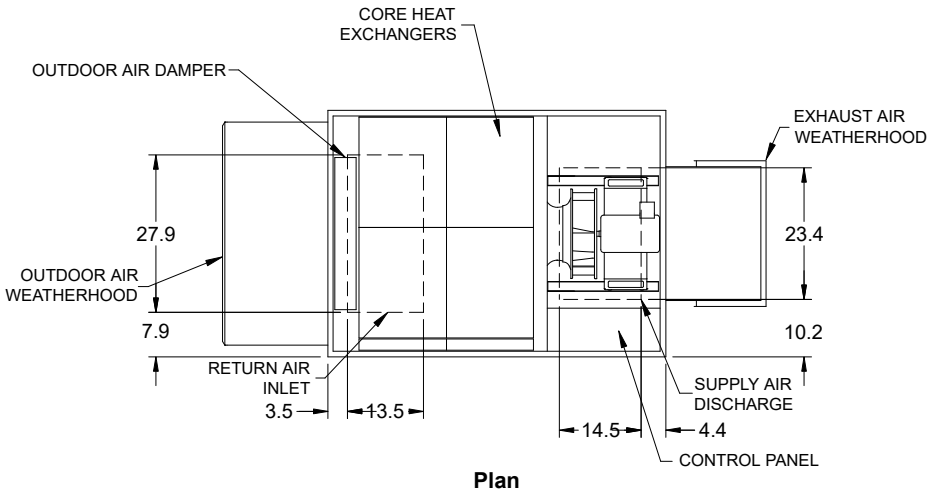
Back Right Isometric



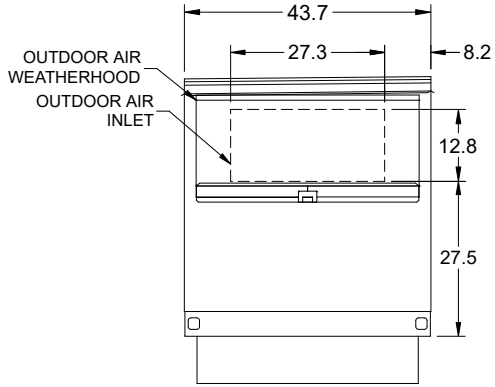
THE NON-ELECTRICAL SIDE CAN BE PLACED AGAINST A WALL. CLEARANCE TO THE ELECTRICAL SIDE IS ESSENTIAL TO PROVIDE ACCESS TO THE CONTROL CENTER AND COMPONENT MAINTENANCE.

Front Left Isometric

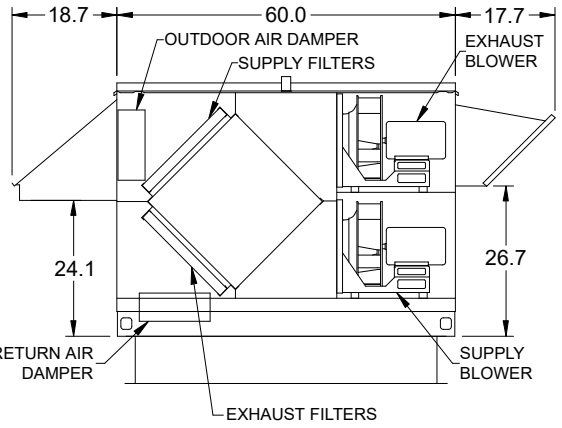
Overview Drawings



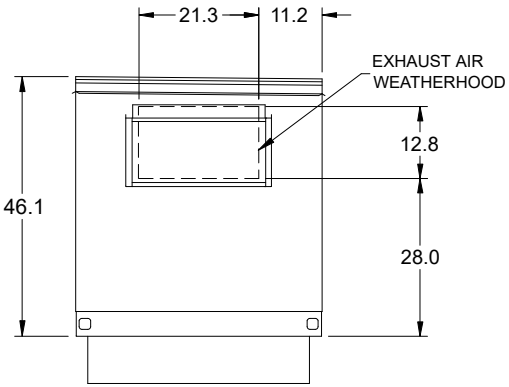
Plan



Left End

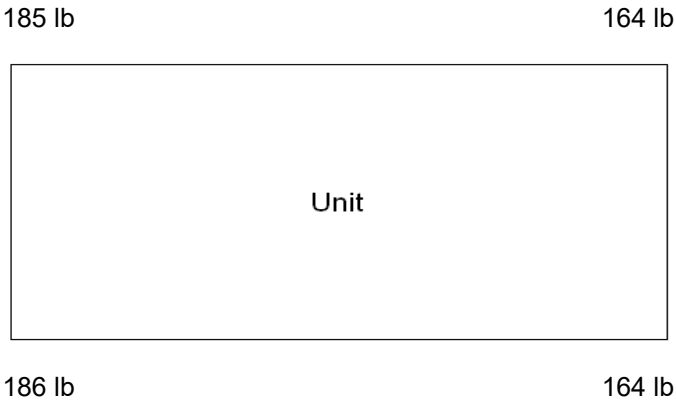


Elevation



Right End

Corner Weights



Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the left. Weights are applied at the base of the unit. Images not drawn to scale.

Terminal Strip Controls

BASIC UNIT CONTROLS:

The Energy Recovery Unit will be provided from the factory with an integral control center including: a single non-fused disconnect, 24 VAC transformer, terminal strip and fan VFDs.

ON/OFF CONTROL:

Within the unit control center, a digital signal must be field wired into the terminal strip (connecting terminals R and G) to control unit startup or shutdown.

This on/off signal is coming from:
By Others: The unit shall be energized by a field supplied and wired digital contact.

Startup (Digital Contact Closes)

- Factory mounted and wired outdoor air damper actuator is powered.
- Factory mounted and wired exhaust air damper actuator is powered.
- Exhaust fan ON.
- Supply fan ON.

Shutdown (Digital Contact Opens)

- Supply and exhaust fan de-energized.
- Outside air damper actuator de-energized, damper spring-return closed.
- Exhaust air damper actuator de-energized, damper spring-return closed.

CONTROL ACCESSORIES

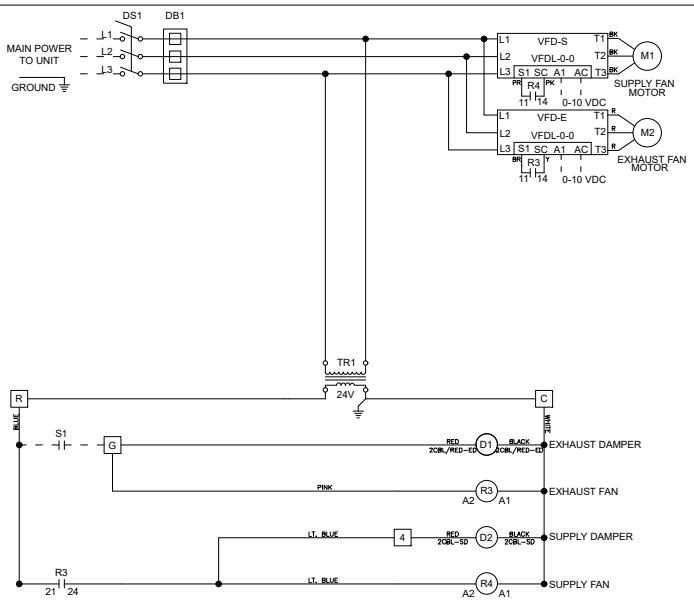
Supply Blower VFD – 0-10 VDC by others:

The supply blower will be provided with a factory mounted variable frequency drive. The supply blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Exhaust Blower VFD – 0-10 VDC by others:

The exhaust blower will be provided with a factory mounted variable frequency drive. The exhaust blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G3LCC1000CXXXXXE34

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D#	DAMPER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
M#	MOTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
S1	FAN SWITCH
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Template Drawing: E34 DOC NUMBER: 3687929 REV: ----

Warranty Statement for ERV Preconditioners

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 18 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.

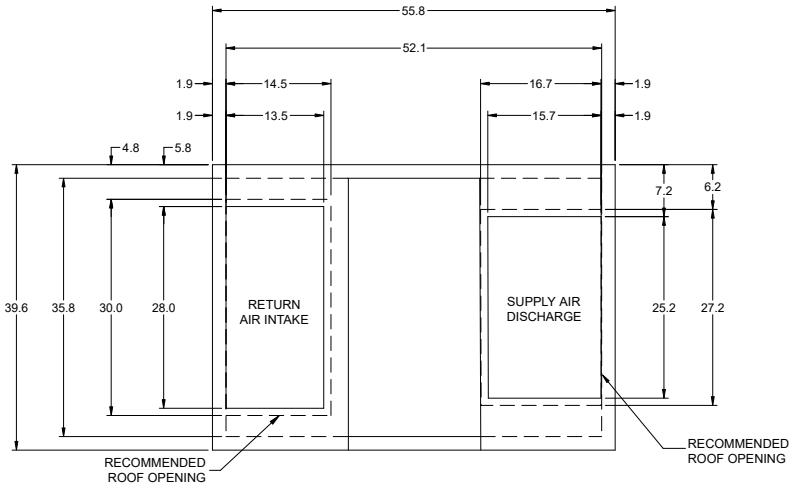
GKD Roof Curb

Model: GKD-39.6/55.8-G14

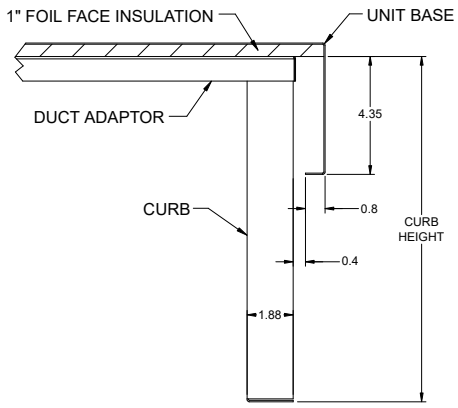
Curb Height (in.)	Curb Length (in.)	Curb Width (in.)	Material	Finish Type	Duct Adapter	Curb Weight (lb)
14	55.8	39.6	Galvanized	Galvanized	Yes	79

Standard Construction Features:
All dimensions shown in inches.
Weight shown is within +/-5%.
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.
18 gauge galvanized steel (perimeter channels).
18 gauge galvanized steel (interior channels).
Ships knocked down for field assembly.
Curb insulation to be provided by others.

Top View of Curb



Cross-Section View of Unit on Curb



ECV-20-P-H

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)			
105	98.0	80.0	27.0	862	862

Unit Specifications

Qty	Weight (lb)	Unit Installation	Unit ETL Listing
1	684 (+/- 5%)	Outdoor	UL 1812

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	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	98.0	80.0	80.5	69.2	75.0	62.5/50	92.3	74.8	39,566.0
Winter	27.0	22.7	58.8	46.0	70.0	54.3/35	37.4	33.5	29,851.0

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	862	0.65	1.085	1309	1	Plenum	Direct
Exhaust	862	0.65	1.057	1370	1	Plenum	Direct

Motor Specifications

Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	0.26	1/2	ODP	SE	1750
Exhaust	1	0.3	1/2	ODP	SE	1750

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	4.3	15.0	0.488

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

Construction Features And Accessories

Unit	
UL-1812	Std
Unit Installation - Outdoor	Std
Outdoor Air Filters - 2" MERV 8, 2-20x20	Std
Exhaust Air Filters - 2" MERV 8, 2-20X20	Std
Energy Recovery Device - Polymer Membrane Energy Recovery Core	Std
Unit Construction - Double Wall	X
Insulation - 1 inch R4 Fiberglass	Std
Corrosion Resistant Fasteners	Std
Access - Hinged	X
Factory Wired Non-Fused Disconnect Switch	Std
Unit Finish - Galvanized	Std
Single Point Power	Std
Supply Weatherhood: Downturn	Std
Exhaust Weatherhood: Downturn	Std
Fan VFDs - Modulating	X
Fan Vibration Isolation - Neoprene	Std
Controls	
Unit Controls - Terminal Strip	X
Sensors	
Unit On/Off Control - By Others	X
Sensor Monitoring Package	
Heating Enable - None	
Cooling Enable - None	
Supply Fan Control	
Exhaust Fan Control	
Network Protocol	
Exhaust Only Operation	
Economizer Control	
Remote Panel	
Control Accessories	
Remote Display	
CO2 Sensor	
Dirty Filter Sensor(s)	
Airflow Monitoring - None	

Accessories	
Frost Control	
Spare Filters	
Shipped Loose Smoke Detectors	
Duct Flange	
Outdoor Air Damper - Low Leakage	X
Return Air Damper - Low Leakage	X
Service Outlet - 120 VAC GFCI Service Outlet, Shipped Loose	
Damper End Switch	
Roof Curb - GKD - 39.6/55.8-G14	X
Spare Fan Belts	
Warranty Options	
Unit Warranty - 18 Months (Std.)	Std
Energy Core Warranty - 5 Yrs	Std

Standard Option	Std
Not Included	
Included	X

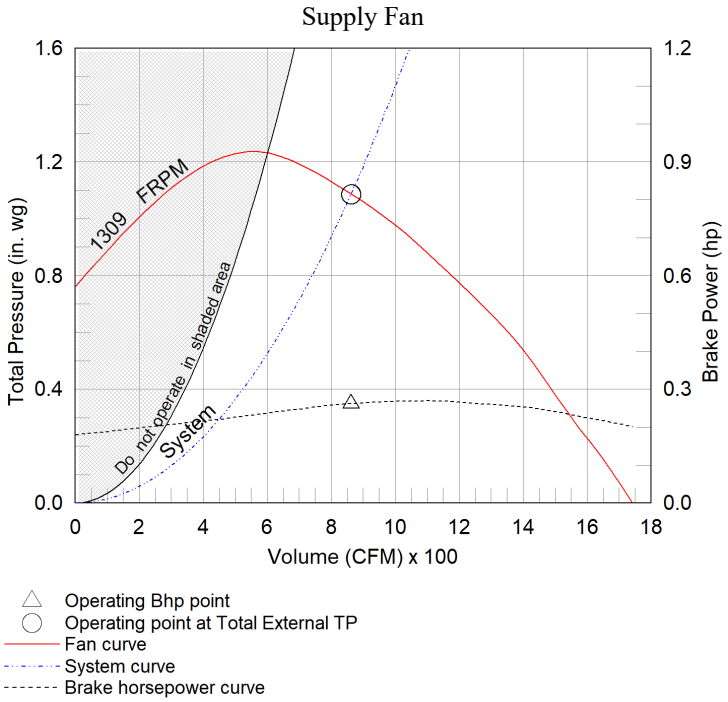
Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A
Return Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

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
862	0.65	1.085	1309	0.26	1	1/2	1	Plenum	Direct

Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.035	0.028	0.01	0.65	1.085

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
79.9	78.4	65.9	68.8	62.9	59.6	58	64.7	71.1	59.6	11.8

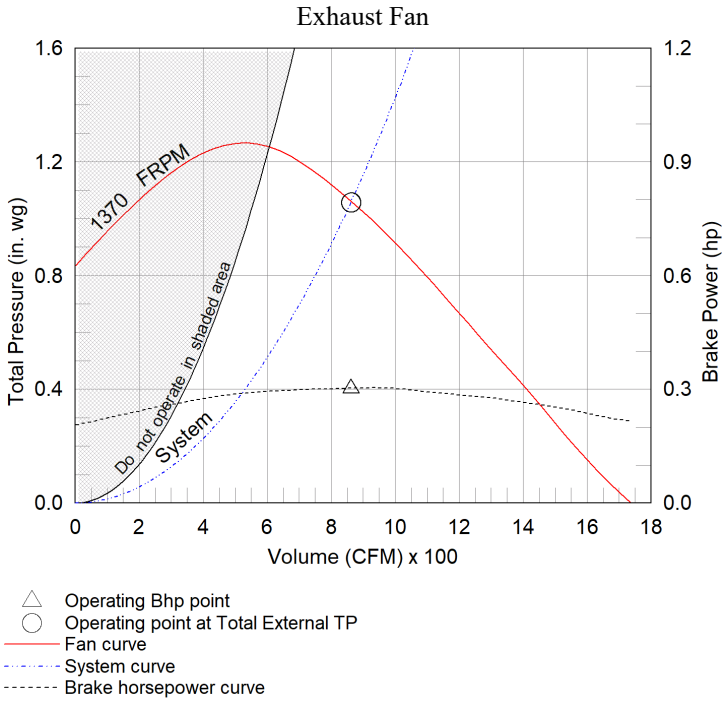


Exhaust Fan Charts And Performance

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
862	0.65	1.057	1370	0.3	1	1/2	1	Plenum	Direct

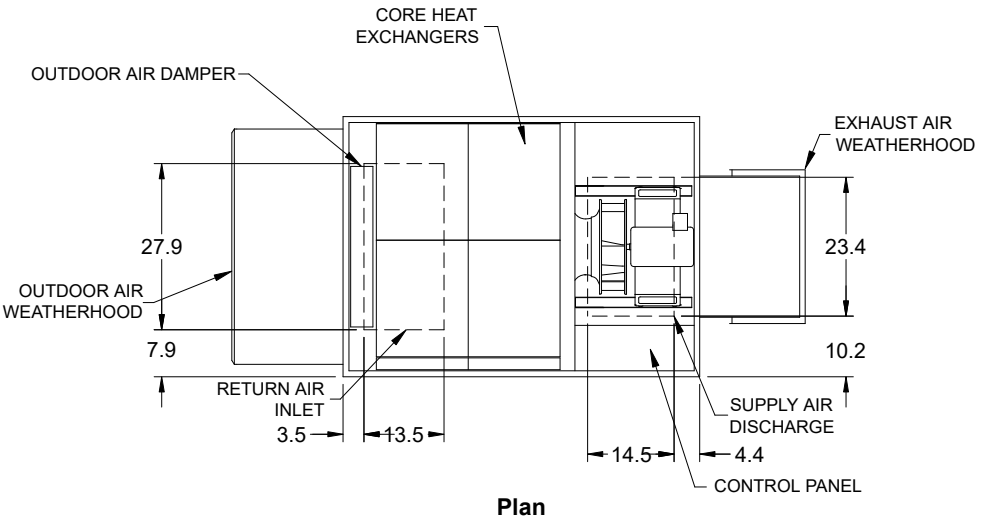
Pressure Drop (in. wg)				
Weatherhood	Filter	Damper	External	Total
0.008	0.028	0.005	0.65	1.057

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
75.3	68.8	60.7	58.8	50.4	49	48.2	39.2	60.6	49.1	5.2



Radiated Sound

Position A



Position D

Position B

Plan

Position C

"E" is the Top Plane

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	78	75	71	70	70	70	68	64	82	76
B	79	76	73	72	76	75	73	69	84	81
C	78	75	70	70	70	69	68	64	81	76
D	75	70	67	64	61	60	56	50	77	67
E	76	70	71	69	68	68	67	63	80	75
Total	85	81	78	76	78	77	76	72	88	84

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

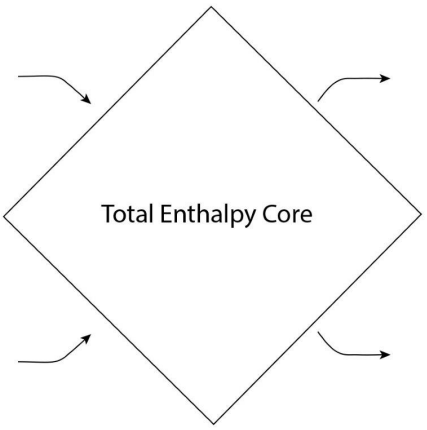
Energy Recovery Summer Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
862	66.2	862	65.8

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		OA Load with Energy Recovery		Equipment Reduction (tons)
(BTU/h)	(tons)	(BTU/h)	(tons)	
59,737.0	4.98	20,171.0	1.68	3.30

Outdoor Air Entering	
Dry Bulb (F)	98.0
Wet Bulb (F)	80.0
Specific Humidity (gr/lb)	127
Enthalpy (BTU/lb)	43.6

Indoor Air Leaving	
Dry Bulb (F)	75.0
Wet Bulb (F)	62.5
Specific Humidity (gr/lb)	65
Enthalpy (BTU/lb)	28.2



Exhaust Air Leaving	
Dry Bulb (F)	92.3
Wet Bulb (F)	74.8
Specific Humidity (gr/lb)	101
Enthalpy (BTU/lb)	38.1

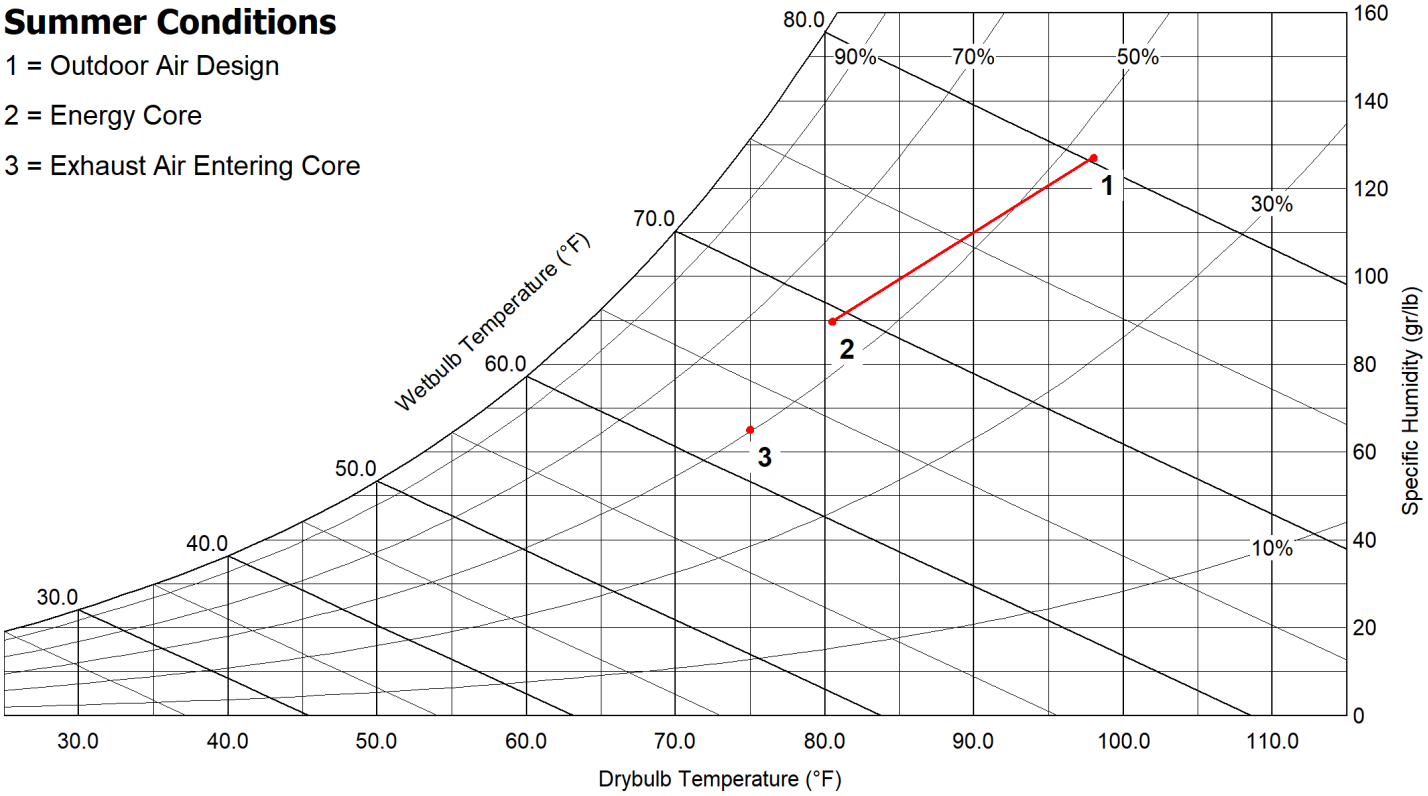
Supply Air Leaving	
Dry Bulb (F)	80.5
Wet Bulb (F)	69.2
Specific Humidity (gr/lb)	90
Enthalpy (BTU/lb)	33.4

Summer Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



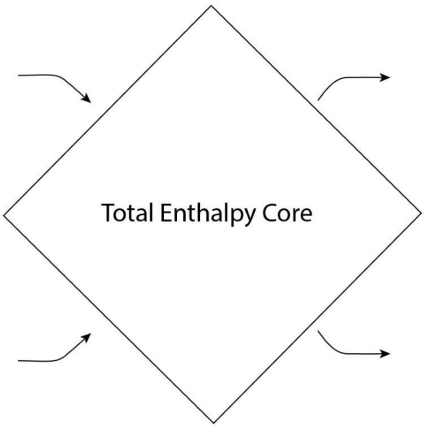
Energy Recovery Winter Performance

Design Air Flow Conditions			
OA Volume (CFM)	ASHRAE 90.1 OA Enthalpy Recovery Ratio	EA Volume (CFM)	EA Core Effectiveness
862	68.5	862	70.2

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	OA Load with Energy Recovery (BTU/h)	Equipment Reduction (BTU/h)	Sensible Effectiveness (%)
40,365.0	10,514.0	29,851.0	73.9

Outdoor Air Entering	
Dry Bulb (F)	27.0
Wet Bulb (F)	22.7
Specific Humidity (gr/lb)	11
Enthalpy (BTU/lb)	8.1

Indoor Air Leaving	
Dry Bulb (F)	70.0
Rel. Humidity (%)	35
Specific Humidity (gr/lb)	38
Enthalpy (BTU/lb)	22.8



Exhaust Air Leaving	
Dry Bulb (F)	37.4
Wet Bulb (F)	33.5
Specific Humidity (gr/lb)	22
Enthalpy (BTU/lb)	12.4

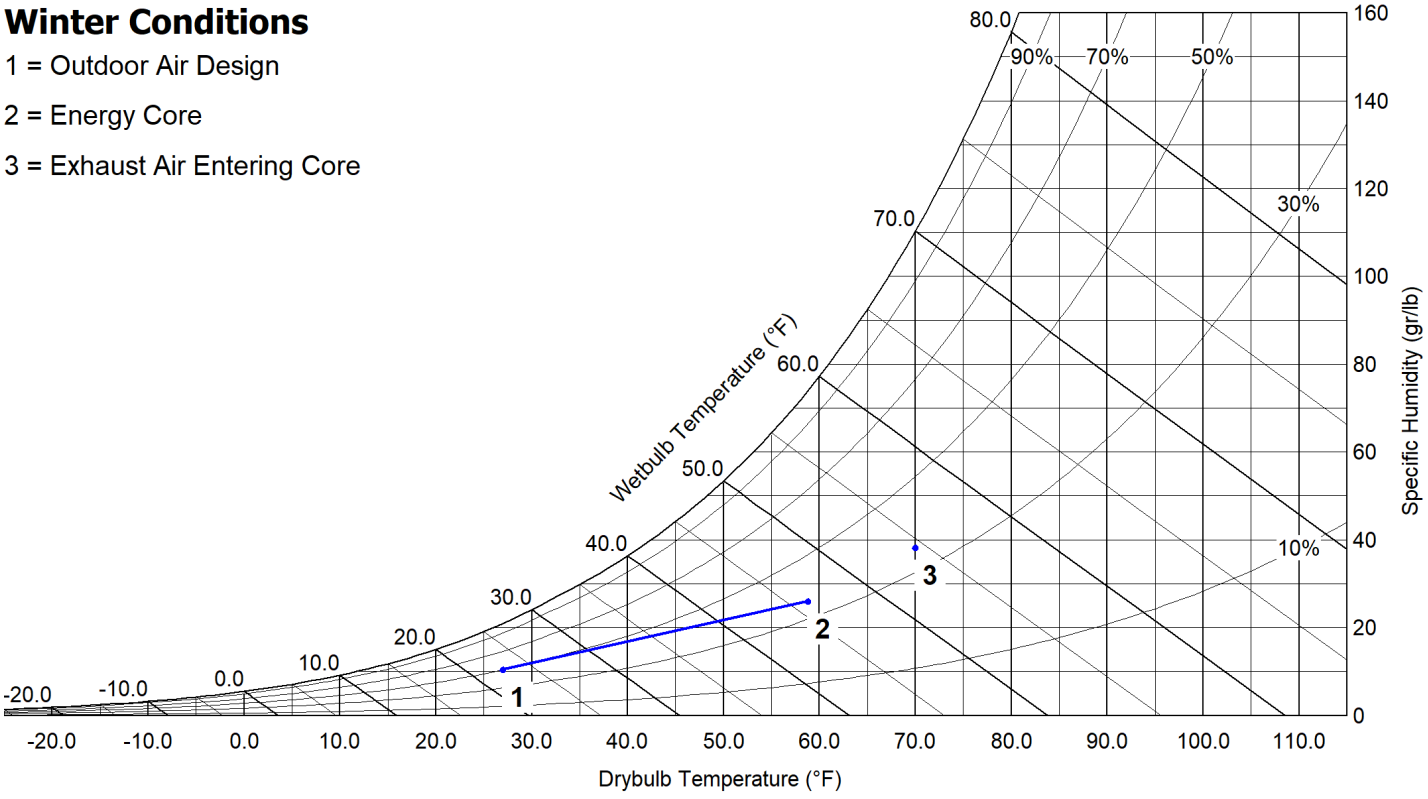
Supply Air Leaving	
Dry Bulb (F)	58.8
Wet Bulb (F)	46.0
Specific Humidity (gr/lb)	26
Enthalpy (BTU/lb)	18.1

Winter Conditions

1 = Outdoor Air Design

2 = Energy Core

3 = Exhaust Air Entering Core



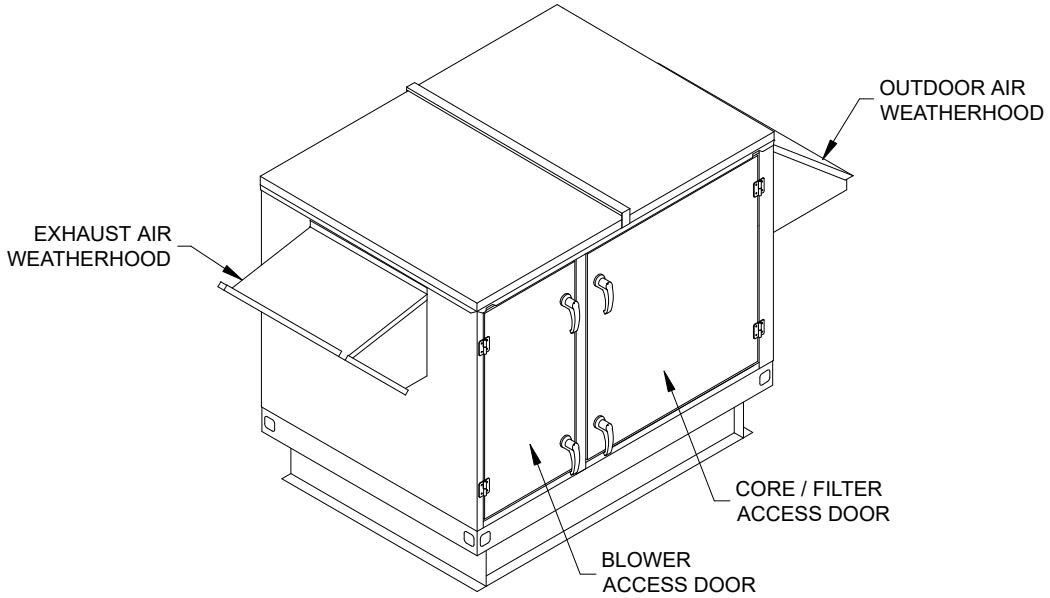
AHRI Performance Ratings

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
862	862	862	0	1.07	0.37	0.37

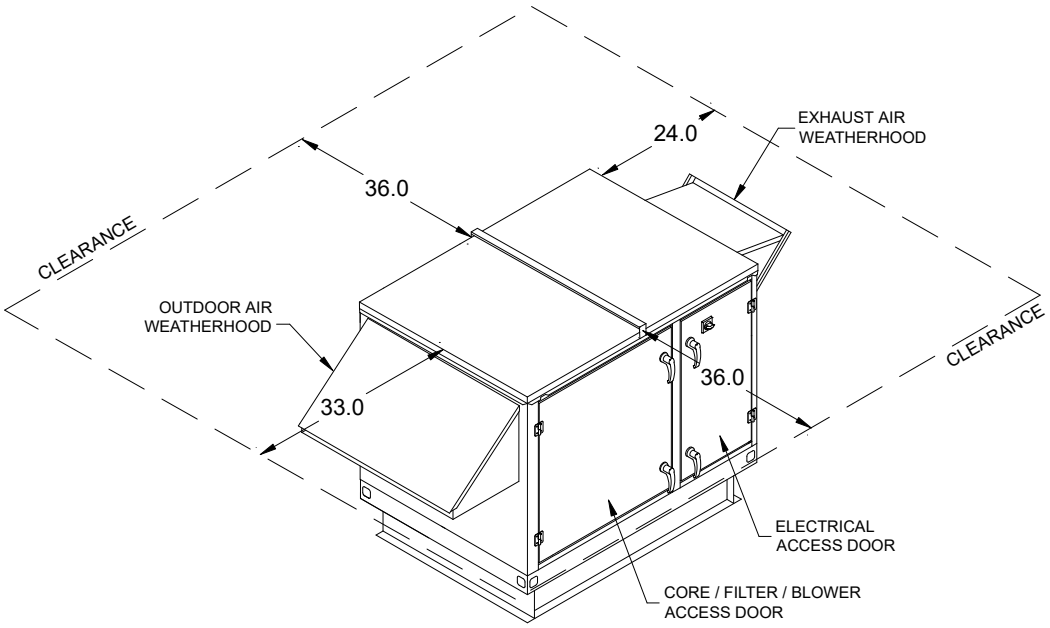
Thermal Effectiveness Ratings							
Enthalpy Recovery Ratio (%)		Sensible Effectiveness (%)		Latent Effectiveness (%)		Total Effectiveness (%)	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
66.2	68.5	76.3	73.9	59.4	56.3	65.8	70.2

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.

Isometric Drawings



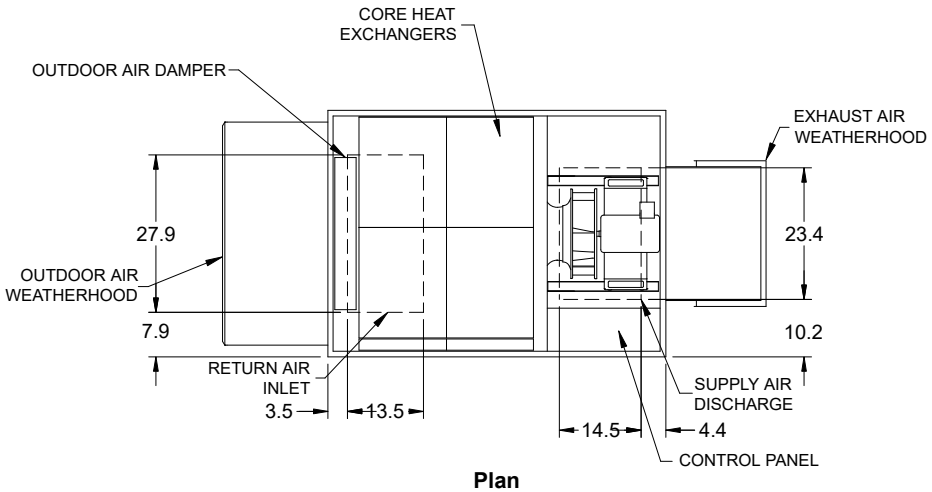
Back Right Isometric



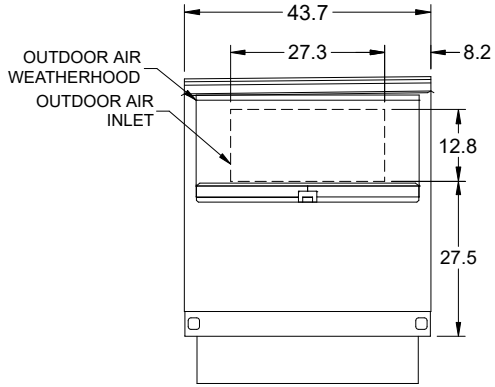
THE NON-ELECTRICAL SIDE CAN BE PLACED AGAINST A WALL. CLEARANCE TO THE ELECTRICAL SIDE IS ESSENTIAL TO PROVIDE ACCESS TO THE CONTROL CENTER AND COMPONENT MAINTENANCE.

Front Left Isometric

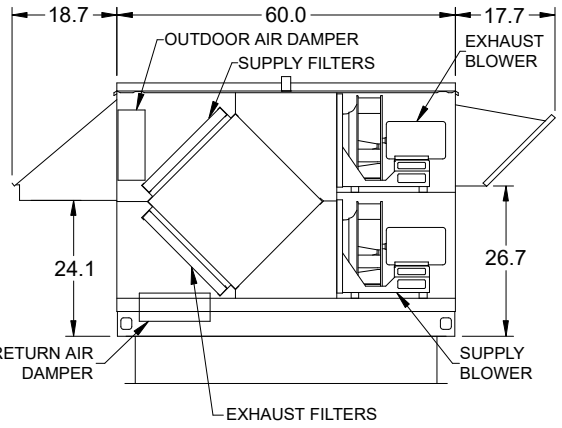
Overview Drawings



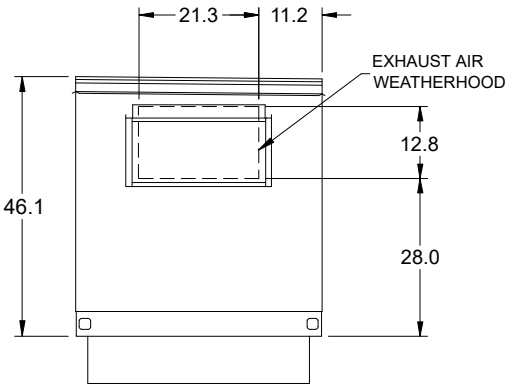
Plan



Left End

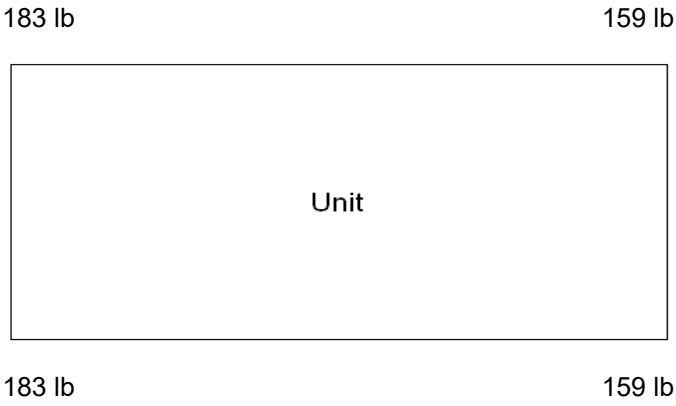


Elevation



Right End

Corner Weights



Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the left. Weights are applied at the base of the unit. Images not drawn to scale.

Terminal Strip Controls

BASIC UNIT CONTROLS:

The Energy Recovery Unit will be provided from the factory with an integral control center including: a single non-fused disconnect, 24 VAC transformer, terminal strip and fan VFDs.

ON/OFF CONTROL:

Within the unit control center, a digital signal must be field wired into the terminal strip (connecting terminals R and G) to control unit startup or shutdown.

This on/off signal is coming from:
By Others: The unit shall be energized by a field supplied and wired digital contact.

Startup (Digital Contact Closes)

- Factory mounted and wired outdoor air damper actuator is powered.
- Factory mounted and wired exhaust air damper actuator is powered.
- Exhaust fan ON.
- Supply fan ON.

Shutdown (Digital Contact Opens)

- Supply and exhaust fan de-energized.
- Outside air damper actuator de-energized, damper spring-return closed.
- Exhaust air damper actuator de-energized, damper spring-return closed.

CONTROL ACCESSORIES

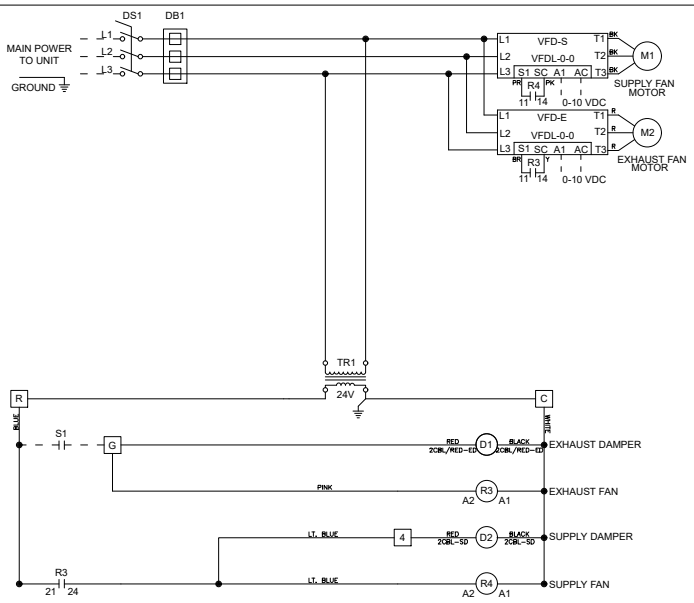
Supply Blower VFD – 0-10 VDC by others:

The supply blower will be provided with a factory mounted variable frequency drive. The supply blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Exhaust Blower VFD – 0-10 VDC by others:

The exhaust blower will be provided with a factory mounted variable frequency drive. The exhaust blower is modulated based upon a 0-10 VDC signal (field provided and wired) wired directly into the VFD. If a 0-10 VDC signal is not field provided the blower VFD will run at the factory default of 30 Hz.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G3LCC1000CXXXXXE34

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D#	DAMPER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
M#	MOTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
S1	FAN SWITCH
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Template Drawing: E34 DOC NUMBER: 3687929 REV: ----

Warranty Statement for ERV Preconditioners

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 18 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.

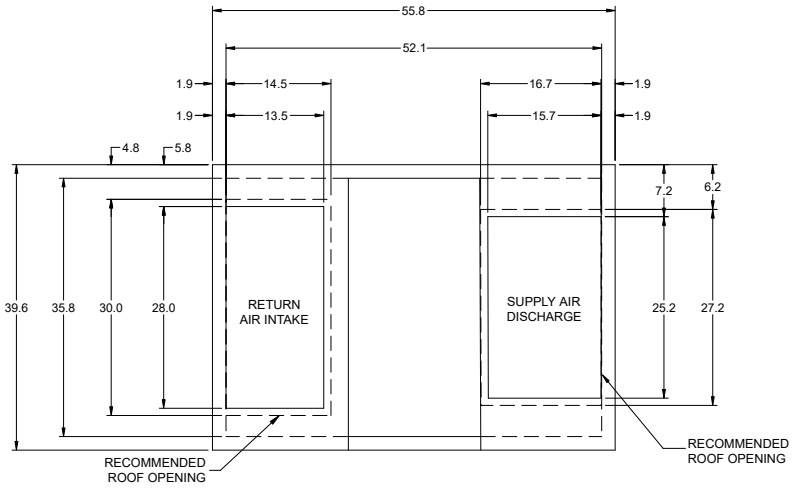
GKD Roof Curb

Model: GKD-39.6/55.8-G14

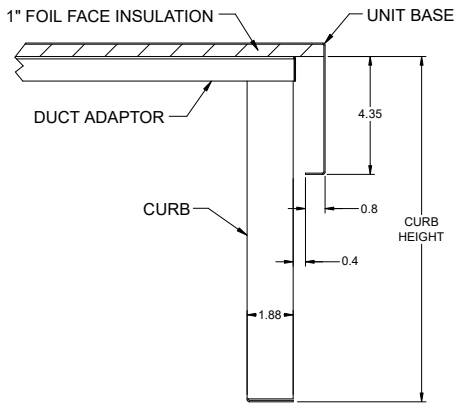
Curb Height (in.)	Curb Length (in.)	Curb Width (in.)	Material	Finish Type	Duct Adapter	Curb Weight (lb)
14	55.8	39.6	Galvanized	Galvanized	Yes	79

Standard Construction Features:
All dimensions shown in inches.
Weight shown is within +/-5%.
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.
18 gauge galvanized steel (perimeter channels).
18 gauge galvanized steel (interior channels).
Ships knocked down for field assembly.
Curb insulation to be provided by others.

Top View of Curb



Cross-Section View of Unit on Curb



Honeywell

Carbon Dioxide Sensor, Wall , LCD Display

Model: C7232A1008 **SKU:** 1430987

Average Rating: n/a

Be the first to write a review!

[redacted]

SPECS

ITEM	CO2 Sensor
TYPE	Wall Mount
FOR USE WITH	HVAC Controllers
COLOR	White
HEIGHT (IN.)	5-1/16
WIDTH (IN.)	3-11/16
DEPTH (IN.)	2
OPERATING TEMP. RANGE (F)	32 to 122
INPUT VOLTAGE	24
SENSOR TYPE	Non-dispersive Infrared (NDIR)
INCLUDES	Display
WEIGHT	0.390000
SKUS	6LJJ9, HONC7232A1008, C7232A1008

DESCRIPTION

Thermostat Sensors and AccessoriesCO2 SensorsNondispersive infrared (NDIR) sensors measure carbon dioxide concentration in ventilated space or duct.

MORE PRODUCTS

Honeywell
Universal Cover Plate

Model: 50002883-001
SKU: 686522

(2 reviews)

[redacted]

Honeywell
Outdoor Sensor, Black

Model: C7089U1006
SKU: 686164

(8 reviews)

[redacted]

Honeywell
Wall Mount Cover Plate

Model: 32003796-001
SKU: 686206

(1 reviews)

[redacted]

CO2 Sensor, Wall Mount, For Use With HVAC Controllers, Color White, Height (In.) 5-1/16, Width (In.) 3-11/16, Depth (In.) 2, Operating Temp. Range (F) 32 to 122, Input Voltage 24, Sensor Type Non-Dispersive Infrared (NDIR), Includes Display