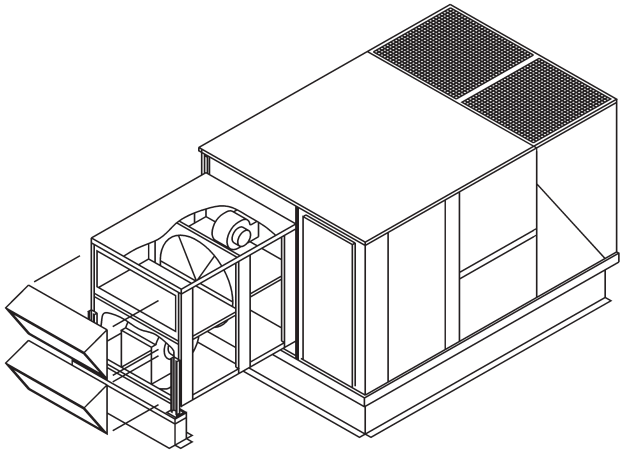
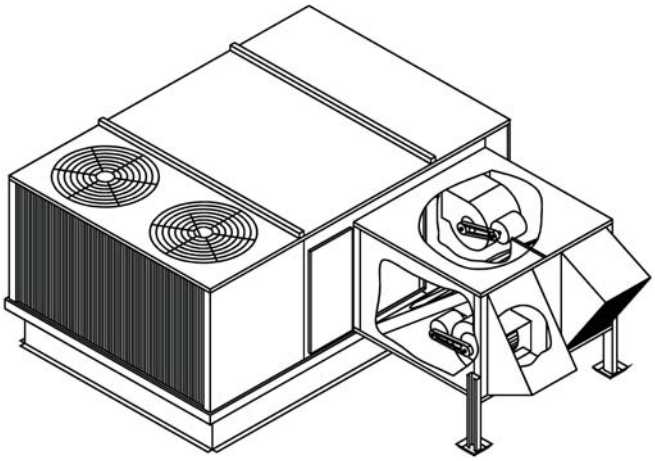
MAXA-MI$ER®

TECHNICAL GUIDE

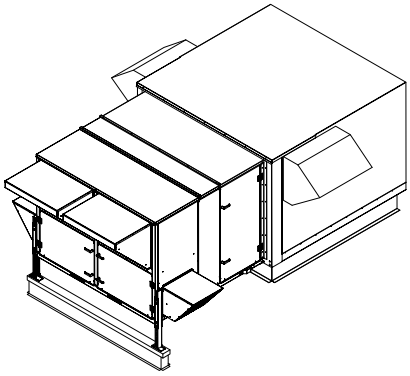
V* Series
Unitized Energy Recovery Ventilators



ERV Unit with 3 - 12.5 Ton Packaged Unit



ERV Unit with 15 - 25 Ton Packaged Unit



ERV Unit with 25 -40 Packaged Unit

DESCRIPTION

- Reduces cooling load at design temperatures up to 4 tons per 1000 cfm of outside air.
- Reduces heating load up to 2.5 Tons Btuh per 1000 CFM of outside air.
- Dry energy transfer. Moisture in supply (intake) air stream is transferred to exhaust air stream in a vapor state, eliminating condensate plumbing from the UERV.
- Attaches directly to the UPG rooftop units. All mounting equipment is provided.
- Separate fused power supply. (Except VR74 or VR122)
- Filters / mist eliminators are provided on the entering air openings.
- Adjustable support legs are provided. (Except for Stand Alone)
- Two modes of operation (Pivoting Wheel Models only)
  - Recovery mode during normal energy recovery operation.
  - True economizer mode when outside sensor calls for economizer operation (3 - 12.5 ton packaged units equipped with economizers). U. S. Patent 5,548,970.
- Pivoting wheel models used with packaged unit with economizer. Sequence of operation controlled by economizer controller. (3- 12.5 Ton Only)
- Balancing dampers provided on VR Modules. (Except VR74 and VR122)
- Centrifugal blowers (both intake and exhaust for high static capability and low sound levels). (Except VR74 and VR122)
- Heavy gauge galvanized steel cabinets corrosion protected with powder paint process that match UPG units.
- Fully insulated cabinet.
- AHRI certified internal enthalpy wheel is provided.
- Internal enthalpy wheel made of polymeric material with silica gel impregnated into the material. The enthalpy wheel has a five year limited warranty.
- Internal enthalpy wheels are easily cleanable. Large wheels (25 inch diameter and above) are split into easily removable pie segments. Smaller wheels can be removed from the ERV.
- Continuous operation down to 10 ºF (-12 ºC) without defrost at indoor relative humidity up to 40%. For temperatures below 10 ºF (-12 ºC), Optional Low Ambient Control Kit is required. Kit includes temperature sensor to control the ERV before frost build up can occur on recovery wheel.

Note: *MAXA-MI$ER*® UERV's are designed for use with rooftops using 14" high or greater roof curbs.

Note: ZF/ZH/ZJ/XP 037 thru 150 or ZS/ZU/ZW/XA-A3 thru -12, with ERV must use ***"slab"*** type economizers and downflow position.

ETL Certified per UL 1995 and CSA 22.2

Energy recovery COMPONENT rated in accordance with AHRI/ANSI Standard 1060-2005 and certified to AHRI. Actual performance in packaged equipment may vary.

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UPG UERV MODEL NOMENCLATURE

UPG UERV Model Nomenclature

V R 028 A12 H 4 A L2 1

Product Category
V = Ventilator

Wheel Type
R = Rooftop Stationary
P = Rooftop Pivoting (036-060 & 078-150 only)

CFM*
006 = 300 to 550
011 = 600 to 1000
020 = 1100 to 1700
028 = 2200 to 2800** 1500 to 2200**
036 = 2800 to 3600
046 = 3400 to 4600
062 = 5500 to 6200** 4800 to 5600**
074 = 6000 to 8000
122 = 8000 to 13000

UPG Rooftop Cabinet
A06 = ZF/ZR/XP036-072 & ZS/ZK/XA -03 Thru -A6
A12 = 50" Models ZF/ZH/ZR/XP 102-150, ZJ078-150 & ZS/ZU/ZK/XA -08 Thru -12, ZW-06 Thru -12
B12 = 42" Models ZF/ZR/XP078-090, ZH037-090, ZJ/ZR037-061 ZS/ZK/XA -06 Thru -07, ZU-A3 Thru-07, ZW/ZK-A3 Thru -A5
A15 = Models ZF180 & ZS-15
A25 = Models ZF210-300, ZJ180-300, XP180-240 & ZS-18 Thru -25, ZW-15 Thru -25, XA-15, -20
A40 = Models Z42, Z33, Z34 & X42, X33, X34 25-40 Tons

Blower Speed
H = High Speed**
M = Medium Speed**
V = Variable Speed
L = Constant Volume

Voltage
2= 208/230v-3ph
4= 460v-3ph
5= 575v-3ph
9= 208/320v-1ph

Duct Type
A = No Selection on Rooftop Units

Additional Options
AA = No Options Installed
L1 = Low Ambient Kit (LAK)*
L2 = LAK & Motorized Outside Air (MOA)*
L3 = LAK, MOA & Stop-Start-Job (SSJ) (not used on P models)*
L4 = LAK, MOA, SSJ & Pressure Sensor (PS) (not used on P)
L5 = LAK & SSJ (not used on P models)*
L6 = LAK, SSJ & PS (not used on P models)
L7 = LAK & PS
L8 = LAK, MOA and PS
M1 = Motorized Outside Air (MOA)*
M2 = MOA, and Stop Start-Jog (SSJ) (not used on P models)*
M3 = MOA, SSJ and Pressure Sensor (PS) (not used on P models)
M4 = MOA and PS
S1 = Stop-Start-Job (SSJ) (not used on P models)*
S2 = SSJ and Pressure Sensor (PS) (not used on P models)
P1 = Pressure Sensor (PS)

Product Generation
1 = First Generation

* CFM is ERV wheel rating. This may vary depending on unit cabinet pressure drop.
** These CFM ranges are dependant upon blower motor selection.

APPLICATIONS

Unitized Energy Recovery Ventilators (UERV) are used with the UPG rooftop packaged units. The internal wheel provides sensible and latent energy exchange between the entering and exhaust air streams of a building. This allows a substantial amount of the energy, which is normally lost in the exhaust air stream to be returned into the entering air. Ideal applications are areas that have cold or hot temperatures, or areas that have high humidity or very low humidity (recover exhaust air from buildings that have humidifiers to add humidity). Application software is available to provide the energy and dollar savings for all areas of the United States and Canada.

PRINCIPLE OF OPERATION

The UERV enthalpy wheel contains parallel layers of a polymeric material that are impregnated with silica gel (desiccant). The wheel is located in the entering (intake) air and exhaust air streams of the ventilation equipment. As the wheel rotates through each air stream, the wheel surface adsorbs sensible and latent energy. In the heating mode, the wheel rotates to provide a constant transfer of heat from the exhaust air stream to the colder intake air stream. During the cooling season, the process is reversed. On units equipped with an economizer (3 - 12.5 tons), the wheel pivots out of the air stream to allow economizer to operate normally for "free cooling" when outdoor temperature and humidity is acceptable. During economizer operation, the UERV exhaust blower continues to run, providing power exhaust for the system. The intake blower is de-energized during economizer operation.

AHRI/ANSI STANDARD 1060-2005 FOR AIR-TO-AIR ENERGY RECOVERY VENTILATION EQUIPMENT

The Air-Conditioning, Heating and Refrigeration Institute (AHRI) issued Standard 1060-2005 to certify air-to-air energy recovery ventilators. This standard deals specifically with the ratings of the Energy Recovery Wheel that is incorporated into the Energy Recovery Ventilator (ERV). All of the UPG ERV's have an AHRI certified energy recovery wheel. The data shown in the specification charts is the AHRI certified ratings for the wheel. Actual performance in the ERV may vary.

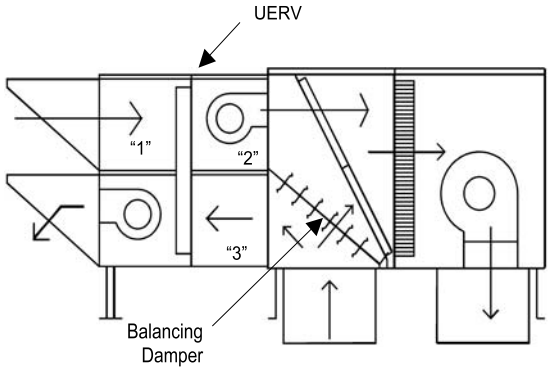


FIGURE 1 - UNITIZED ENERGY RECOVERY VENTILATOR

Critical Terms for Standard 1060 are as follows:

1. **Effectiveness**. The measured energy recovery effectiveness not adjusted to account for that portion of the psychrometric change in the leaving supply air (Station 2) that is the result of leakage of entering exhaust air (Station 3) rather than exchange of heat or moisture between the air streams.

2. **Net Effectiveness**. The measured recovery effectiveness adjusted to account for that portion of the psychometric change in the leaving supply air (Station 2) that is the result of leakage of the entering exhaust air (Station 3) rather than exchange of heat or moisture between the air streams.

3. **Exhaust Air Transfer Ratio (EATR)**. The tracer gas concentration difference between the leaving supply air (Station 2) and entering supply (outdoor) air stream (Station 1) divided by the tracer gas concentration in the entering exhaust (return) air (Station 3) at the 100% rated air-flow, expressed as a percentage.

4. **Outdoor Air Correction Factor (OACF)**. The entering supply (outdoor) airflow (Station 1) divided by the measured (gross) leaving supply airflow (Station 2).

ENERGY RECOVERY WHEEL

The heart of the Energy Recovery Ventilator is the Energy Recovery Wheel (defined by AHRI as a rotary heat exchanger). The wheel has a patented design of parallel layers of wrapped polymeric material that is impregnated with a silica gel (desiccant). This unique design makes it the only truly cleanable wheel on the market today. The small wheels (30 inch diameter and smaller) are slide out cassettes, and the larger wheels have pie segments that are removable for cleaning.

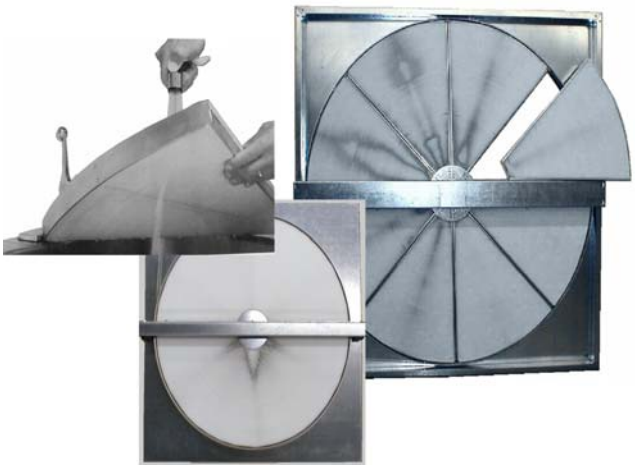


FIGURE 2 - ENERGY RECOVERY WHEEL

CROSS LEAKAGE IN UERV'S (PURGE SECTORS)

The issue of cross leakage in rotary wheel based UERV's used in space conditioning applications is often misunderstood. As a result, many systems are installed with purge sectors and the additional fan capacity required to allow these sectors to function when in fact they are unnecessary. A better understanding of the rational for the purge sector, and its history, allows us to dispense with the purge sector, its added first cost and continuing cost of operation.

A purge sector minimizes the carry over cross leakage from the exhaust into the supply (outside air) air stream by shunting a portion of the supply air back into the exhaust air stream across the seal separating the exhaust and supply. This is required in industrial applications where the exhaust carries contaminants. This typically results in air volume being 15% to 20% higher to get the desired air intake, and the cost associated with it.

In space conditioning applications, where the ventilation is operating to maintain acceptable indoor air quality, there are no contaminants in concentrations large enough to cause concern. Cross leakage in the UERV system results in a small amount of the exhaust air, typically less than 5% in balanced airflow, returning to the space. This is not contaminated air, as some would suggest. It is however air that effectively never left the space. The operation cost of moving this air is far less than that required for a purge sector. Do not use the UPG UERV's in applications that have concentrations of contaminants.

TABLE 1: UERV OUTSIDE AIR CFM SELECTION BY CFM

Unit-Tons	300-550	600-1000	1100-1700	1500-2800	2800-3600	3400-4600	4800-5600	5500-6200	6000-8000	8000-13000
Rooftop	1.5 - 6	1.5 - 6	Stand Alone type ERV's are available for all tonnage sizes.							
		7.5 - 12.5	7.5 - 12.5	7.5 - 12.5						
				15 - 25	15 - 25	15 - 25	15 - 25	15 - 25		
									25 - 40	30 - 40
Stand Alone ERV's are available for equipment room applications.										

OPTIONAL ACCESSORIES - FIELD INSTALLED

UERV Equipment Support - 8 inch (203 mm) high base for support of the exhaust and intake end of the UERV. Must be ordered separately from the UERV.

UERV	Equipment Support Part No.
VR006	1ES0401
VR/P011	1ES0402
VR/P020	1ES0402
VR/P028	1ES0402

UERV	Equipment Support Part No.
VR036	1ES0403
VR046	1ES0403
VR062	1ES0404
VR074	
VR122	

Roof Curb - A 14 or 24 inch (355 or 610 mm) roof curb is required to match supply and exhaust openings of the UERV with the rooftop units. UPG provides a full line of roof curbs to match the specified unit. See specification pages for required curb. Must be ordered separately from UERV.

Stand Alone Balancing Damper - Balancing dampers are used with VO and VS models when ERV is connected to the rooftop unit, not to ductwork on the roof.

OPTIONAL ACCESSORIES - FACTORY INSTALLED

Low Ambient Control Kit - Prevents frost formation on energy wheel heat transfer surfaces by terminating the intake blower operation when discharge air temperature falls below a field selectable temperature setting. Intake blower operation resumes operation after temperature rises above the adjustable temperature differential.

Pressure Sensor - Measurement device on the UERV to determine airflow across the Wheel.

Motorized Intake Air Damper - Damper mounts in the outdoor air intake hood. It opens when the UERV is energized and closes when de-energized.

Stop-Start-Jog - Function that rotates the Enthalpy Wheel (non-pivoting models) on a preset timer to prevent contamination of the wheel during economizer operation.

ERV Option Codes (ex.: VR028A12H4AL3 would be an R28 series high speed 460 volt UERV with a Low Ambient kit, Motorized Outside Air, and Stop-Start-Jog kit.)

L1 - Low Ambient Kit (LAK) *

L2 - LAK & Motorized. Outside Air (MOA) *

L3 - LAK, MOA, & Stop-Start-Jog (SSJ) *

L4 - LAK, MOA, SSJ, & Pressure Sensor (PS)

L5 - LAK and SSJ *

L6 - LAK, SSJ, and PS

L7 - LAK and PS

L8 - LAK, MOA, and PS

M1 - Motorized Outside Air (MOA) *

M2 - MOA and Stop-Start-Jog (SSJ) *

M3 - MOA, SSJ, and Pressure Sensor (PS)

M4 - MOA and PS

S1 - Stop-Start-Jog (SSJ) *

S2 - SSJ and Pressure Sensor (PS)

P1 - Pressure Sensor (PS)

NOTE: * denotes only options available for VR074 & VR122.

HOW TO SELECT THE PROPER AIR CONDITIONING UNIT AND UNITARY ENERGY RECOVERY VENTILATOR

1. Determine the air conditioning load requirements with the required amount of outside air without an UERV.

2. Select the proper UERV for the outside air CFM requirements and calculate the tonnage reduction through the UST or UERV software programs.

3. Select the air conditioning unit required by reducing the load determined in step 1 by the reduction in step 2. (Example: If the load in Step 1 was 10 tons, and the reduction in Step 2 was 2.5 tons, select a 7.5 ton unit.)

4. Select the proper UERV based on the selected unit. SEE Page 3 UERV Nomenclature for Details

TABLE 2: PERFORMANCE - 3 THROUGH 12 1/2 TON UNITS

"R" Series Stationary Wheel for Units without Economizers								
UPG Packaged Unit Model No.	Unit Size (Tons)	ERV CFM Range	Matching ERV Model	Voltage & Phase	Voltage Code	Nominal AHRI Data (Total		
						CFM	Net Effectiveness	
							Heating	Cooling
ZF036-072 ZR036-060 XP036-060 ZS-03-A6 ZK-03-05 XP-03-05	3 - 6	300-550	VR006A06H	110v-1ph	1	500	65%	64%
				208/230v-1ph	9			
				208/240v-3ph	2			
				460v-3ph	4			
		600-1000	VR011A06H	208/230v-1ph	9	900	73%	72%
				208/230v-3ph	2			
				460v-3ph	4			
				575v-3ph	5			
(42") ZH037-090 ZF078-090 ZJ037-061 ZR037-090 ZU-A3-07 ZS-06-07 ZW-A3-A5 ZK-A3-07	3 - 7.5	300-550	VR006B06H	208/230v-3ph	2	500	65%	64%
				460v-3ph	4			
				575v-3ph	5			
		600-1000	VR011B12H	208/230v-3ph	2	900	73%	72%
				460v-3ph	4			
				575v-3ph	5			
		1100-1700	VR020B12H	208/230v-3ph	2	1600	65%	64%
				460v-3ph	4			
				575v-3ph	5			
(50") ZF102-150 ZH102-150 ZJ078-150 XP102-150 ZR102-150 ZS-08-12 ZU-08-12 ZW-06-12 XA-08-12 ZK-08-12	6.5 - 12.5	600-1000	VR011A12H	208/230v-3ph	2	900	73%	72%
				460v-3ph	4			
				575v-3ph	5			
		1100-1700	VR020A12H	208/230v-3ph	2	1600	65%	64%
				460v-3ph	4			
				575v-3ph	5			
		1500-2200	VR028A12M	208/230v-3ph	2	1950	71%	70%
				460v-3ph	4			
				575v-3ph	5			
		2200-2800	VR028A12H	208/230v-3ph	2	2600	65%	63%
				460v-3ph	4			
				575v-3ph	5			

Note 1: Complete UPG ERV model number includes the electrical information. Example ZF 060 needing 500 CFM outside of air at 230 volts/3 phase. Model would be a VR006A06H2AAA1.

TABLE 3: PERFORMANCE - 15 THROUGH 25 TON UNITS

Use this table to determine ventilation and size requirements. Table shows UPG packaged units and matching ERV model, Air Flow Range, and AHRI rated Net Effectiveness at 100% of rated CFM.

"R" Series Stationary Wheel for Units without Economizers								
UPG Packaged Unit Model No.	Unit Size (Tons)	ERV CFM Range	Matching ERV Model	Voltage & Phase	Voltage Code	Nominal AHRI Data (Total		
						CFM	Net Effectiveness	
							Heating	Cooling
ZF180 ZJ180 ZR180 XP180 ZS-15 ZW-15 ZK-15 XA-15	15	1500-2200	VR028A25H	208/230v-3ph	2	1950	71%	70%
				460v-3ph	4			
				575v-3ph	5			
		2200-2800	VR028A25H	208/230v-3ph	2	2600	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		2800-3600	VR036A15H	208/230v-3ph	2	3100	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		3400-4600	VR046A15H	208/230v-3ph	2	3900	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		4800-5600	VR062A25M	208/230v-3ph	2	4125	71%	70%
				460v-3ph	4			
				575v-3ph	5			
		5500-6200	VR062A25H	208/230v-3ph	2	5500	65%	63%
				460v-3ph	4			
				575v-3ph	5			
ZJ210-300 ZR240-300 ZF210-300 XP240 ZW-18-25 ZK-20-25 ZF-18-25 XA-20	17.5 - 25	2200-2800	VR028A25H	208/230v-3ph	2	2600	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		2800-3600	VR036A25H	208/230v-3ph	2	3100	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		3400-4600	VR046A25H	208/230v-3ph	2	3900	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		4800-5600	VR062A25M	208/230v-3ph	2	4125	71%	70%
				460v-3ph	4			
				575v-3ph	5			
		5500-6200	VR062A25H	208/230v-3ph	4	5500	65%	63%
				460v-3ph	5			
				575v-3ph	2			
Z42 Z33 Z34 X42 X33 X34	25-40	6000-8000	VR074A40*	208/230v-3ph	2	6600	65%	63%
				460v-3ph	4			
				575v-3ph	5			
		8000-13000	VR122A40*	208/230v-3ph	2	10800	65%	63%
				460v-3ph	4			
				575v-3ph	5			

Note 1: Complete UPG ERV model number includes the electrical information. Example: ZJ180 needing 2800 CFM outside of air at 230 volts/3 phase. Model would be a VR028A15H2AAA1.

Note 2: For VR074 and VR122 units used with an economizer must have the Start-Stop-Jog (SSJ) option.

TABLE 4: PERFORMANCE - PIVOTING WHEEL MODELS

"P" Series Pivoting Wheel for Units with Economizers									
UPG Packaged Unit Model No.	Unit Size (Tons)	ERV CFM Range	Max. CFM Power Exhaust	Matching ERV Model	Voltage & Phase	Voltage Code	Nominal AHRI Data (Total		
							CFM	Net Effectiveness	
								Heating	Cooling
ZF036-072 ZR036-060 XP036-060 ZS-03-A6 ZK-03-05 XA-03-05	3 - 6	600-1000	1900	VP011A06H	208/230v-1ph	9	900	73%	72%
					208/240v-3ph	2			
					460v-3ph	4			
					575v-3ph	5			
(42") ZH037-090 ZF078-090 ZJ037-061 ZR037-090 XP078-090 ZU-A3-07 ZS-06-07 ZW-A3-A5 ZK-A3-07 XA-06-07	3 - 7.5	600-1000	1900	VP011B12H	208/230v-3ph	2	900	73%	72%
					460v-3ph	4			
					575v-3ph	5			
		1100-1700	3000	VP020B12H	208/230v-3ph	2	1600	65%	64%
					460v-3ph	4			
					575v-3ph	5			
(50") ZF102-150 ZH102-150 ZJ078-150 ZR102-150 XP102-150 ZS-08-12 ZU-08-12 ZW-06-12 ZK-08-12 XA-08-12	6.5 - 12.5	600-1000	1900	VP011A12H	208/230v-3ph	2	900	73%	72%
					460v-3ph	4			
					575v-3ph	5			
		1100-1700	3000	VP020A12H	208/230v-3ph	2	1600	65%	64%
					460v-3ph	4			
					575v-3ph	5			
		1500-2200	3450	VP028A12M	208/230v-3ph	2	1950	71%	70%
					460v-3ph	4			
					575v-3ph	5			
		2200-2800	4200	VP028A12H	208/230v-3ph	2	2600	65%	63%
					460v-3ph	4			
					575v-3ph	5			

Note 1: Complete UPG ERV model number includes the electrical information. Example ZF 060 needing 800 CFM outside of air at 230 volts/3 phase. Model would be a VP011A06H2AAA1.

2: Models ZF/ZH/ZJ/XP* 037-150 & ZS/ZU/ZW/ZK/XA -A3-12 with ERV must use "slab" type economizers and downflow position.

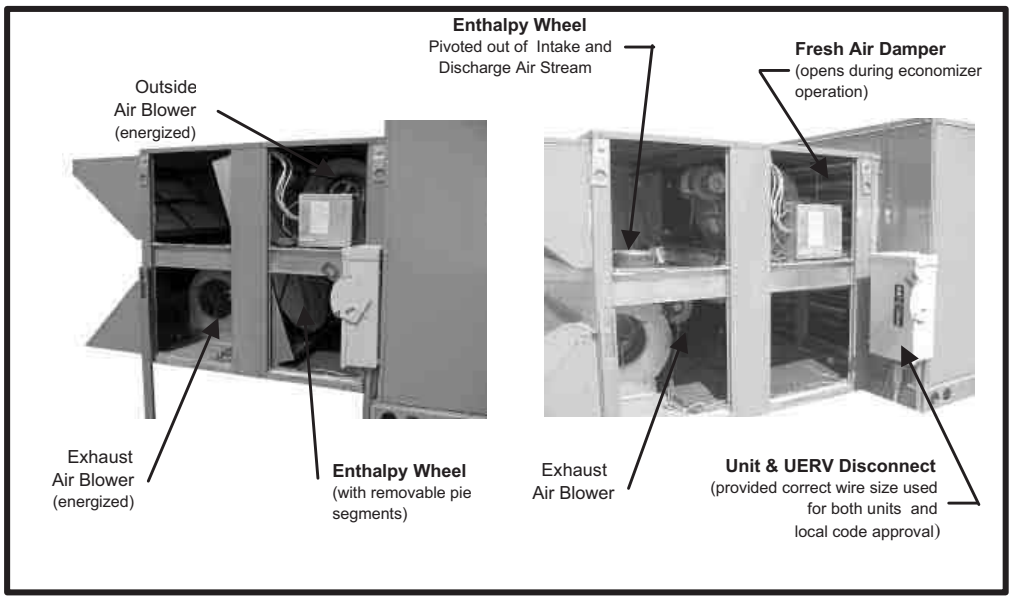


FIGURE 3 - “P” SERIES PIVOTING WHEEL FOR UNITS W/ECONOMIZERS

TABLE 5: SPECIFICATIONS AND ELECTRICAL DATA - 300 THROUGH 550 CFM ERV'S

Model Numbers		VR006 - Rooftop Stationary		
Line Voltage - 60hz		115v-1ph	208/230v/460-1ph	208/230v/460-3ph
Fresh Air Blower	Motor - hp / type	0.25 / PSC		
	Wheel Size (dia x width) - in	5.5 x 6.3		
	Motor Speed - rpm	1780		
	Motor Speed(s)	2		
	Bearing Type	Sleeve		
	Full Load Amps	3.8		
	Service Factor	1.1		
Exhaust Air Blower	Motor - hp	0.25 / PSC		
	Wheel Size (dia x width) - in	5.5 x 6.3		
	Motor Speed - rpm	1780		
	Motor Speed(s)	2		
	Bearing Type	Sleeve		
	Full Load Amps-Stationary	3.8		
	Service Factor	1.1		
Wheel Electrical Data	Potential Volts	115		
	Motor Speed (RPM)/Wheel (RPM)	1050/68		
	Full Load Amps	0.7		
Total Electrical	MCA	8.7		
	OCPD	10		
Wheel Data	Wheel Depth	2		
	Wheel Diameter	19.3		
	Construction / Media Type	One Piece / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	500 @ .6Δ		
	EATR - -0.50 H_2O	9.90%		
	EATR - 0.00 H_2O	0.20%		
	EATR - +0.50 H_2O	0.00%		
	OACF - -0.50 H_2O	1.02%		
	OACF - 0.00 H_2O	1.33		
	OACF - +0.50 H_2O	1.59%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	65%	70%
	100% Airflow Cooling	68%	60%	64%
	75% Airflow Cooling	73%	65%	69%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	65%	70%
	100% Airflow Cooling	68%	60%	64%
	75% Airflow Cooling	73%	65%	69%
Curb	A/C Unit Curb Height - in	14		
Weights	Shipping Weight - lbs.	198		
	Net Weight - lbs.	155		

Note: 1: A stepdown transformer is provided to stepdown high voltage primary to 115 volt secondary.

TABLE 6: SPECIFICATIONS AND ELECTRICAL DATA - 600 THROUGH 1700 CFM ERV'S

Model Numbers		VR011 - Rooftop Stationary VP011 - Rooftop Pivoting				VR020 - Rooftop Stationary VP020 - Rooftop Pivoting		
Line Voltage - 60hz		208/ 230v-1ph	208/ 230v-3ph	460v- 1ph	460v-3ph	208/230v-3ph	460v-3ph	575v-3ph
Fresh Air Blower	Motor - hp / type	.5 / PSC				1.0 / Belt		
	Wheel Size (dia x width) - in	10 x 6 AT				9 x 9		
	Motor Speed - rpm	1120 / 960 / 850				1725		
	Motor Speed(s)	3				Adjustable Sheave		
	Bearing Type	Sleeve				Ball		
	Full Load Amps	3.4				3.8	1.9	1.4
	Service Factor	1				1.15		
Exhaust Air Blower	Motor - hp Stationary	.5 / PSC				1.0 / Belt		
	Motor - hp Pivoting	.5 / PSC				1.5 / Belt		
	Wheel Size (dia x width) - in	10 x 6 AT				9 x 9		
	Motor Speed - rpm	1120 / 960 / 850				1725		
	Motor Speed(s)	3				Adjustable Sheave		
	Bearing Type	Sleeve				Ball		
	Full Load Amps-Stationary	3.4	3.4	1.5	1.5	3.8	1.9	1.4
	Full Load Amps-Pivoting	3.4	3.4	1.5	1.5	5.6	2.8	2.0
	Service Factor	1				1.15		
Wheel Electrical Data	Potential Volts	208 / 230				208 / 230		
	Motor Speed (RPM)/Wheel (RPM)	1050/56				1050/46		
	Full Load Amps	0.3				0.3		
Total Electrical	MCA - Stationary	8.25	8.25	4.4	4.4	8.85	4.58	3.45
	OCPD - Stationary	10	10	6	6	12	6	5
	MCA - Pivoting	8.25	8.25	4.4	4.4	11.1	5.7	4.2
	OCPD - Pivoting	10	10	6	6	15	8	6
Wheel Data	Wheel Depth - in	3				3		
	Diameter - in	25.3				30.346		
	Construction / Media Type	Segmented / Polymeric				Segmented / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	900 @ 1.0Δ				1600 @ .95Δ		
	EATR - -1.00 H_2O	9.30%				7.80%		
	EATR - 0.00 H_2O	0.70%				0.40%		
	EATR - +1.00 H_2O	0.00%				0.00%		
	OACF - -1.00 H_2O	0.97%				0.97%		
	OACF - 0.00 H_2O	1.19%				1.16%		
	OACF - +1.00 H_2O	1.34%				1.29%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**		**Sensible**	**Latent**	**Total**
Total Effec-tive-ness	100% Airflow Heating	76%	68%	73%		68%	61%	65%
	75% Airflow Heating	81%	73%	78%		72%	67%	71%
	100% Airflow Cooling	76%	68%	72%		68%	61%	64%
	75% Airflow Cooling	81%	73%	76%		72%	67%	70%
Net Effec-tive-ness	100% Airflow Heating	76%	68%	73%		68%	61%	65%
	75% Airflow Heating	81%	73%	78%		72%	67%	71%
	100% Airflow Cooling	76%	68%	72%		68%	61%	64%
	75% Airflow Cooling	81%	73%	76%		72%	67%	70%
Curb	A/C Unit Curb Height - in	14				14		
Weights	Shipping Weight - lbs.	318				425		
	Net Weight - lbs.	245				345		

Note: 1. Pivoting electrical data applies to VP models only.

TABLE 7: SPECIFICATIONS AND ELECTRICAL DATA - 1500 THROUGH 2800 CFM ERV'S

Model Numbers		* VR028 - Rooftop Stationary * VP028 - Rooftop Pivoting		
Line Voltage - 60hz		208/230v-3ph	460v-3ph	575v-3ph
Fresh Air Blower	Motor - hp / type	1.5 / Belt		
	Wheel Size (dia x width) - in	10 x 10		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps	5.6	2.8	2
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	1.5 / Belt		
	Motor - hp Pivoting	3 / Belt		
	Wheel Size (dia x width) - in	10 x 10		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps-Stationary	5.6	2.8	2
	Full Load Amps-Pivoting	9	4.4	3.6
	Service Factor	1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.17		
	Potential Volts	200-208 / 230		
	Motor Speed (RPM)/Wheel (RPM)	825/58		
	Full Load Amps	0.6		
Total Electrical	MCA - Stationary	13.2	6.9	5.1
	OCPD - Stationary	20	10	7
	MCA - Pivoting	17.5	8.9	7.1
	OCPD - Pivoting	25	12	10
Wheel Data	Wheel Depth x Diameter - in	3 x 37.759		
	Construction / Media Type	Segmented Pies / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	2600 @ .95Δ		
	EATR - -1.00 H_2O	6.10%		
	EATR - 0.00 H_2O	0.40%		
	EATR - +1.00 H_2O	0.00%		
	OACF - -1.00 H_2O	0.99%		
	OACF - 0.00 H_2O	1.13%		
	OACF - +1.00 H_2O	1.23%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Curb	A/C Unit Curb Height - in	14		
Weights	Shipping Weight - lbs.	470		
	Net Weight - lbs.	395		

* Electric data is for (A12) ZH/ZF/ZJ 078-150 and XP 078-150 only.
** Electric data is for (A15 and A25) ZH/ZF/ZJ 180-300 and XP 180 and 240 only.
Note: Pivoting electrical data applies to VP models only.

TABLE 8: SPECIFICATIONS AND ELECTRICAL DATA - 2800 THROUGH 3600 CFM ERV'S

Model Numbers		VR036 - Rooftop Stationary		
Line Voltage - 60hz		208/230v-3ph	460v-3ph	575v-3ph
Fresh Air Blower	Motor - hp / type	2 / Belt		
	Wheel Size (dia x width) - in	12 x 9		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps	7.0	3.5	3.2
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	3 / Belt		
	Wheel Size (dia x width) - in	12 x 9		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps-Stationary	7.0	3.5	3.2
	Service Factor	1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.50		
	Potential Volts	200-208 / 230		
	Motor Speed (RPM)/Wheel (RPM)	1725/64		
	Full Load Amps	1.2		
Total Electrical	MCA - Stationary	16.4	8.6	6.6
	OCPD - Stationary	25	12	9
Wheel Data	Wheel Depth x Diameter - in	3 x 41.825		
	Construction / Media Type	Segmented Pies / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	3100 @ .9Δ		
	EATR - -1.00 H_2O	4.90%		
	EATR - 0.00 H_2O	1.30%		
	EATR - +1.00 H_2O	0.30%		
	OACF - -1.00 H_2O	0.99%		
	OACF - 0.00 H_2O	1.07%		
	OACF - +1.00 H_2O	1.12%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Curb	A/C Unit Curb Height - in	24 On A15 Or A25		
Weights	Shipping Weight - lbs.	571		
	Net Weight - lbs.	475		

TABLE 9: SPECIFICATIONS AND ELECTRICAL DATA - 3400 THROUGH 5600 CFM ERV'S

Model Numbers		VR046 - Rooftop Stationary		
Line Voltage - 60hz		208/230v-3ph	460v-3ph	575v-3ph
Fresh Air Blower	Motor - hp / type	3 / Belt		
	Wheel Size (dia x width) - in	12 x 12		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps	9.4	4.3	3.4
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	3 / Belt		
	Wheel Size (dia x width) - in	12 x 12		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps-Stationary	9	4.4	3.6
	Service Factor	1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.5		
	Potential Volts	200-208 / 230		
	Motor Speed (RPM)/Wheel (RPM)	1075/57		
	Full Load Amps	1.2		
Total Electrical	MCA - Stationary	22	11	9.1
	OCPD - Stationary	30	15	12
Wheel Data	Wheel Depth x Diameter - in	3 x 46.776		
	Construction / Media Type	Segmented Pies / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	3900 @ .95Δ		
	EATR - -1.00 H_2O	4.40%		
	EATR - 0.00 H_2O	1.10%		
	EATR - +1.00 H_2O	0.20%		
	OACF - -1.00 H_2O	0.99%		
	OACF - 0.00 H_2O	1.06%		
	OACF - +1.00 H_2O	1.11%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Curb	A/C Unit Curb Height - in	24 On A15 Or A25		
Weights	Shipping Weight - lbs.	920		
	Net Weight - lbs.	805		

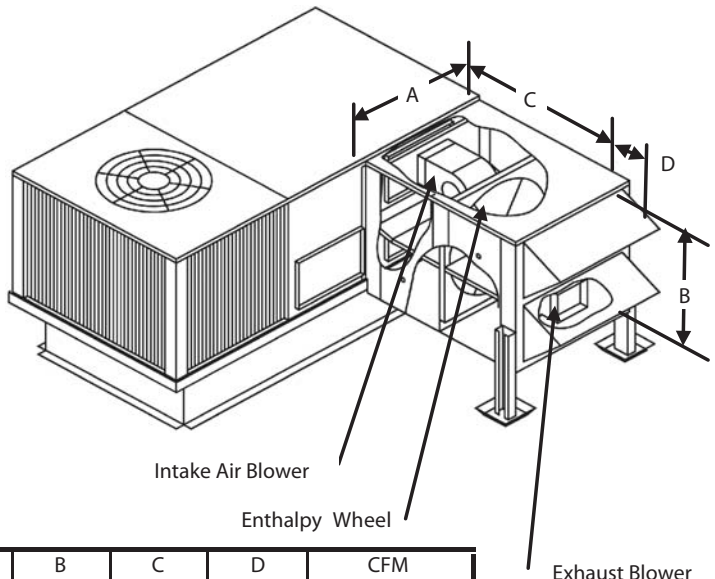
TABLE 10: SPECIFICATIONS AND ELECTRICAL DATA - 5500 THROUGH 6200 CFM ERV'S

Model Numbers		VR062 - Rooftop Stationary		
Line Voltage - 60hz		208/230v-3ph	460v-3ph	575v-3ph
Fresh Air Blower	Motor - hp / type	5 / Belt		
	Wheel Size (dia x width) - in	12 x 12		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps	15	7.4	5.8
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	5 / Belt		
	Wheel Size (dia x width) - in	12 x 12		
	Motor Speed - rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps-Stationary	14.8	7	5.1
	Service Factor	1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.5		
	Potential Volts	200-208 / 230		
	Motor Speed (RPM)/Wheel (RPM)	1075/54		
	Full Load Amps	1.2		
Total Electrical	MCA - Stationary	34.8	17.5	13.6
	OCPD - Stationary	40	25	20
Wheel Data	Wheel Depth x Diameter - in	3 x 52.026		
	Construction / Media Type	Segmented Pies / Polymeric		
Enthalpy Wheel AHRI Rating Data	Nominal Airflow CFM	5500 @ .95Δ		
	EATR - -1.00 H_2O	4.00%		
	EATR - 0.00 H_2O	1.00%		
	EATR - +1.00 H_2O	0.20%		
	OACF - -1.00 H_2O	0.99%		
	OACF - 0.00 H_2O	1.06%		
	OACF - +1.00 H_2O	1.10%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Curb	A/C Unit Curb Height - in	24 On A15 Or A25		
Weights	Shipping Weight - lbs.	1250		
	Net Weight - lbs.	1075		

TABLE 11: SPECIFICATIONS AND ELECTRICAL DATA - 6000 THROUGH 13000 CFM UERV'S

UERV Series		VR074			VR122		
Line Voltage - 60hz		208/230v-3ph	460v-3ph	575v-3ph	208/230v-3ph	460v-3ph	575v-3ph
Exhaust Air Blower	Motor - hp	(2) 5 / Belt			(2) 7.5 / Belt		
	Wheel Size (dia x width) - in	(2) 12 x 12			(2) 15 x 15		
	Motor Speed - rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	14.8	7	5	22.4	9.7	7.8
	OCPD	20	9	7	30	15	10
	Service Factor	1.15			1.15		
Wheel Electrical Data	Motor - hp (3 phase)	0.25	0.25	0.25	0.25	0.25	0.25
	Motor Speed (RPM)/Wheel (RPM)	850/49			850/51		
	Full Load Amps	2.5	1.2	0.95	2.5	1.2	0.95
	OCPD	3	2	2	3	2	2
Total Electrical	MCA	34.9	16.6	12.7	52	22.6	19
	OCPD	50	20	15	70	30	25
Wheel Data	Wheel Depth x Diameter - in	3 x 58			3 x 74		
	Construction / Media Type	Segmented Pies / Polymeric			Segmented Pies / Polymeric		
Enthalpy Wheel Airflow Data	Nominal Airflow CFM	6600 @ .95Δ			10800 @ .95Δ		
	EATR - -1.00 H_2O	4.60%			3.40%		
	EATR - 0.00 H_2O	1.90%			1.20%		
	EATR - +1.00 H_2O	0.90%			0.40%		
	OACF - -1.00 H_2O	0.99%			0.99%		
	OACF - 0.00 H_2O	1.05%			1.04%		
	OACF - +1.00 H_2O	1.09%			1.07%		
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**	**Sensible**	**Latent**	**Total**
Total Effective-ness	100% Airflow Heating	68%	60%	65%	68%	60%	65%
	75% Airflow Heating	73%	67%	71%	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%	73%	67%	70%
Net Effective-ness	100% Airflow Heating	68%	60%	65%	68%	60%	65%
	75% Airflow Heating	73%	67%	71%	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%	73%	67%	70%
Curb	A/C Unit Curb Height - in	14			14		
Weights	Shipping Weight - lbs.	2800			3000		
	Net Weight - lbs.	2600			2800		

Models
ZF036-072
ZR036-060
XP036-060
ZS-03-A6
ZK-03-05
XA-03-05



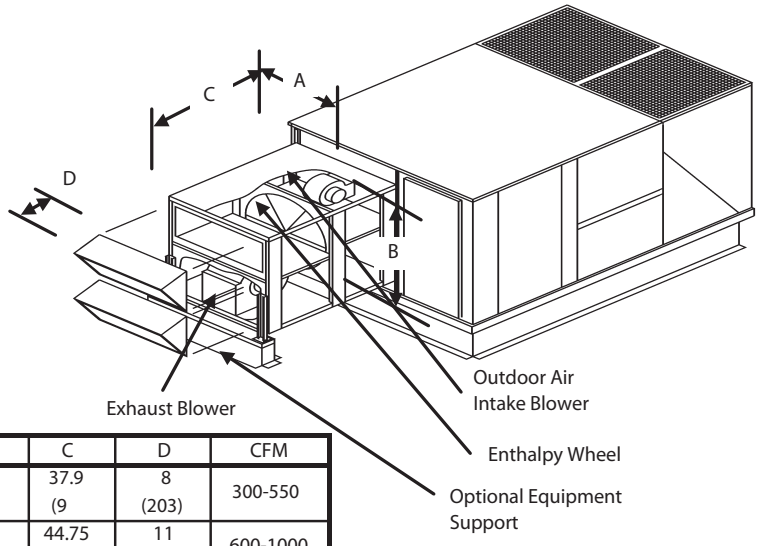
14" High Curbs Required - -1RC0434

ERV Model	Unit Size	A	B	C	D	CFM
VR006A06H	036-072 -03 -A6	24.75 (629)	24.63 (624)	37.9 6 (964)	8 (203)	300-550
VR011A06H	036-072 -03 -A6	32.13 (816)	33.5 (851)	48.75 (1238)	8 (203)	600-1000
VP011A06H	036-072 -03 -A6	32.13 (816)	33.5 (851)	48.75 (1238)	8 (203)	600-1000

FIGURE 4 - UERV DIMENSIONAL DATA - 036 THROUGH 072 & -03 THROUGH -A6 (3-6 TONS)

Models
ZH037, 049, 061, 078, 090, 102, 120, 150
ZF078, 090, 102, 120, 150
ZR037, 049, 061, 078, 090, 102, 120, 150
XP078, 090, 102, 120, 150
ZU-A3, -A4, -A5, -06, -07, -08, -10, -12
ZS-06, -07, -08, -10, -12
ZK-A3, -A4, -A5, -06, -07, -08, -10, -12
XA-06, -07, -08, -10, -12

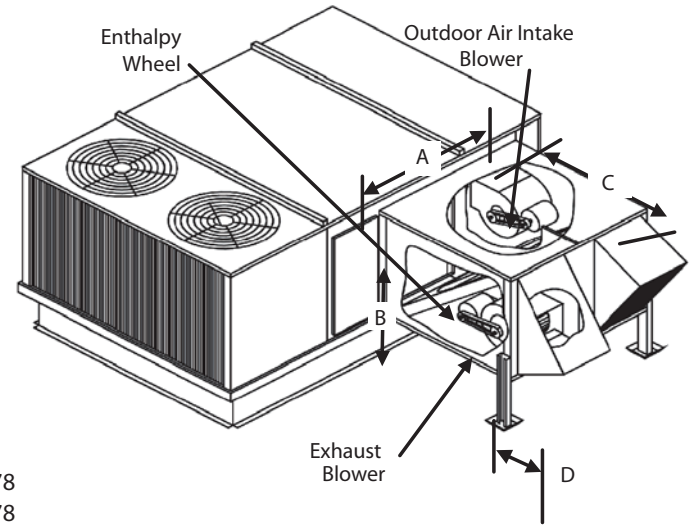
14" High Curbs Required on "VR06" - 1RC0471
14" High Curbs Required on "VR011" & "VP011" - 1RC0471
14" High Curbs Required on "VR020" & "VP020" - 1RC0476
14" High Curbs Required on "VR028" & "VP028" - 1RC0476



Model Number	Unit Size	A	B	C	D	CFM
VR006B12H	037-061 -A3 -A5	24.75 (629)	24.63 (624)	37.9 (9	8 (203)	300-550
VR011B12H VP011B12H	078-102 -06 -08	32.13 (816)	33.5 (851)	44.75 (1137)	11 (279)	600-1000
VR020B12H VP020B12H	078-102 -06 -08	37.25 (946)	37.5 (953)	60.38 (1533)	20.32 (516)	1100-1700
VR011A12H VP011A12H	090-150 -07 -12	32.13 (816)	33.5 (851)	44.75 (1137)	11 (279)	600-1000
VR020A12H VP020A12H	090-150 -07 -12	37.25 (946)	37.5 (953)	60.38 (1533)	20.32 (516)	1100-1700
VR028A12M VP028A12M	090-150 -07 -12	42.63 (1083)	43.56 (1106)	64.25 (1631)	18.32 (466)	1500-2200
VR028A12H VP028A12H	090-150 -07 -12	42.63 (1083)	43.56 (1106)	64.25 (1631)	18.32 (466)	2200-2800

FIGURE 5 - UERV DIMENSIONAL DATA - 037 THROUGH 150 & A3 THROUGH -12 (3 - 12 1/2 TONS)

Models
ZF180, 210, 240, 300
ZR180, 240, 300
ZJ180, 210, 240, 300
XP180, 240
ZS-15, -18, -20, -25
ZK-15, -20, -25
ZW-15, -18, -20, -25
XA-15, -20

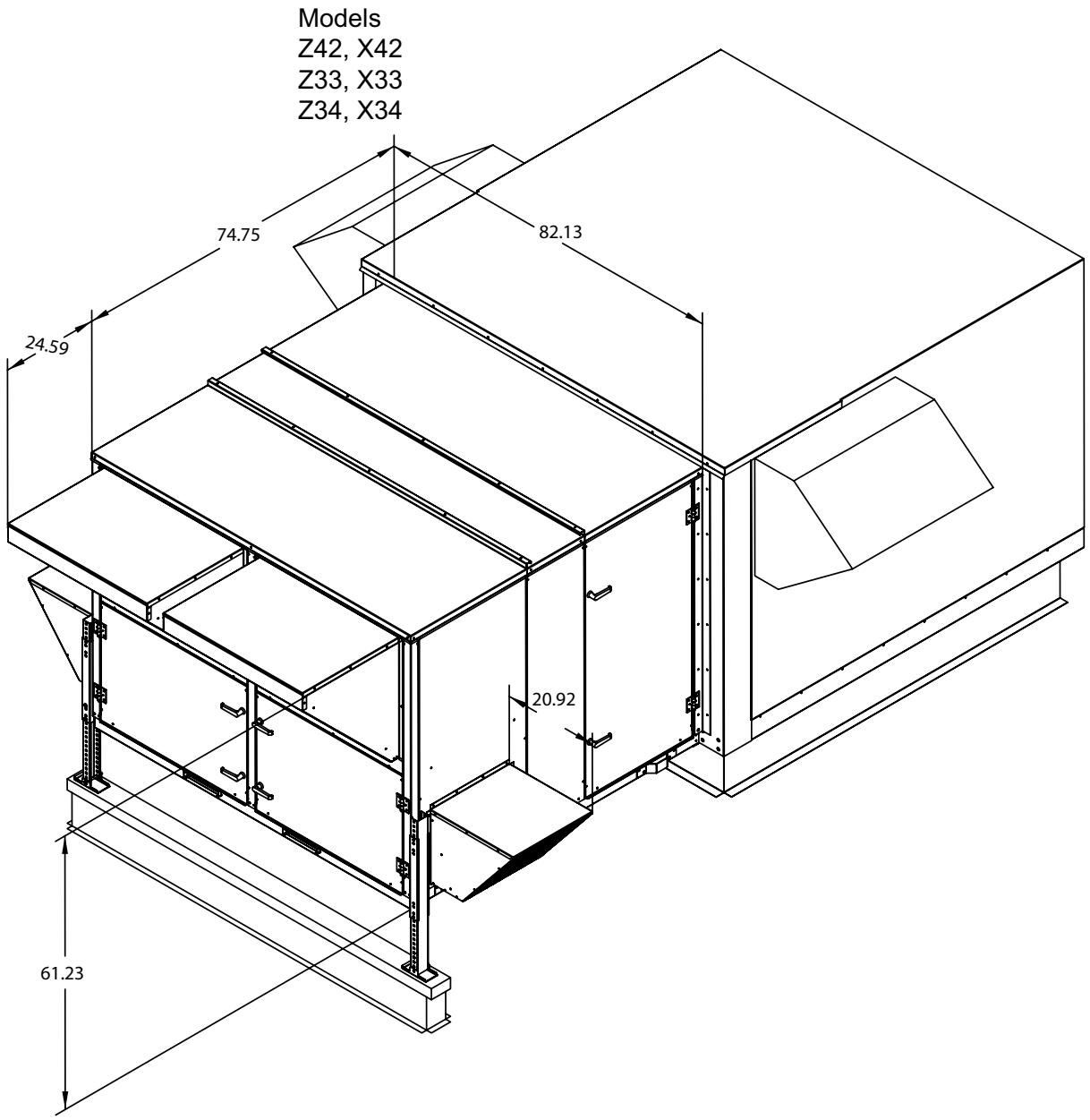


14" Roofcurbs Required on "VR028" - 1RC0436 - 437
24" High Curbs Required on "VR036" - 1RC0477 or 1RC0478
24" High Curbs Required on "VR046" - 1RC0477 or 1RC0478
24" High Curbs Required on "VR062" - 1RC0477 or 1RC0478

Model Number	Unit Size	A	B	C	D	CFM
VR028A15M	180, -15	42.63 (1083)	43.56 (1106)	52.13 (1327)	22.50 (572)	1500-2200
VR028A15H						2200-2800
VR028A25M	180-300, -15-25					
VR036A15H	180, -15	46.68 (1186)	57.38 (1457)	60.00 (1524)	30.50 (775)	2800-3600
VR036A25H	180-300, -15-25					
VR046A15H	180-300, -15-25	52.68 (1338)	57.38 (1457)	60.00 (1524)	30.50 (775)	3400-4600
VR046A25H	180-300, -15-25					
VR062A15M	180, -15	58.88 (1496)	57.38 (1457)	60.00 (1524)	30.50 (775)	4800-5600
VR062A25M	180-300, -15-25					
VR062A15H	180, -15	58.88 (1496)	57.38 (1457)	60.00 (1524)	30.50 (775)	5500-6200
VR062A25H	180-300, -15-25					

NOTE: Refer to Unit Price Pages for exact unit, ERV and curb matchup.

FIGURE 6 - UERV DIMENSIONAL DATA - 180 THROUGH 300 & -15 THROUGH -25 (15 - 25 TONS)



- Designed to meet unit specifications
- 14’ High Curbs Required
- Rooftop unit blower exceeds the capacity of the ERV Exhaust Blowers

Model Number	CFM	Description
VR074A40L	6000 - 8000	Constant Volume
VR074A40V	6000 - 8000	Variable Air Volume
VR122A40L	8000 - 13000	Constant Volume
VR122A40V	8000 - 13000	Variable Air Volume

- See blower performance charts for airflow at various external static pressures.

FIGURE 7 - MODEL UNIT VR074 AND VR122 (25 - 40 TON)

TABLE 12: BLOWER PERFORMANCE CHART - VR074

Exhaust						
Blower RPM for VR074, (2) 5HP, Barometric Hood						
		External Static Pressure (in water)				
		0	0.5	1	1.5	2
CFM	6000	910	1060	1200	1300	1400
	6500	955	1095	1225	1360	1430
	7000	1000	1130	1260	1380	1475
	7500	1040	1170	1290	1400	1500
	8000	1080	1200	1315	1425	1530

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	910-1320	Standard Unit
High	1325-1565	Optional Kit (01-KIT-RH58)

TABLE 13: BLOWER PERFORMANCE CHART - VR122

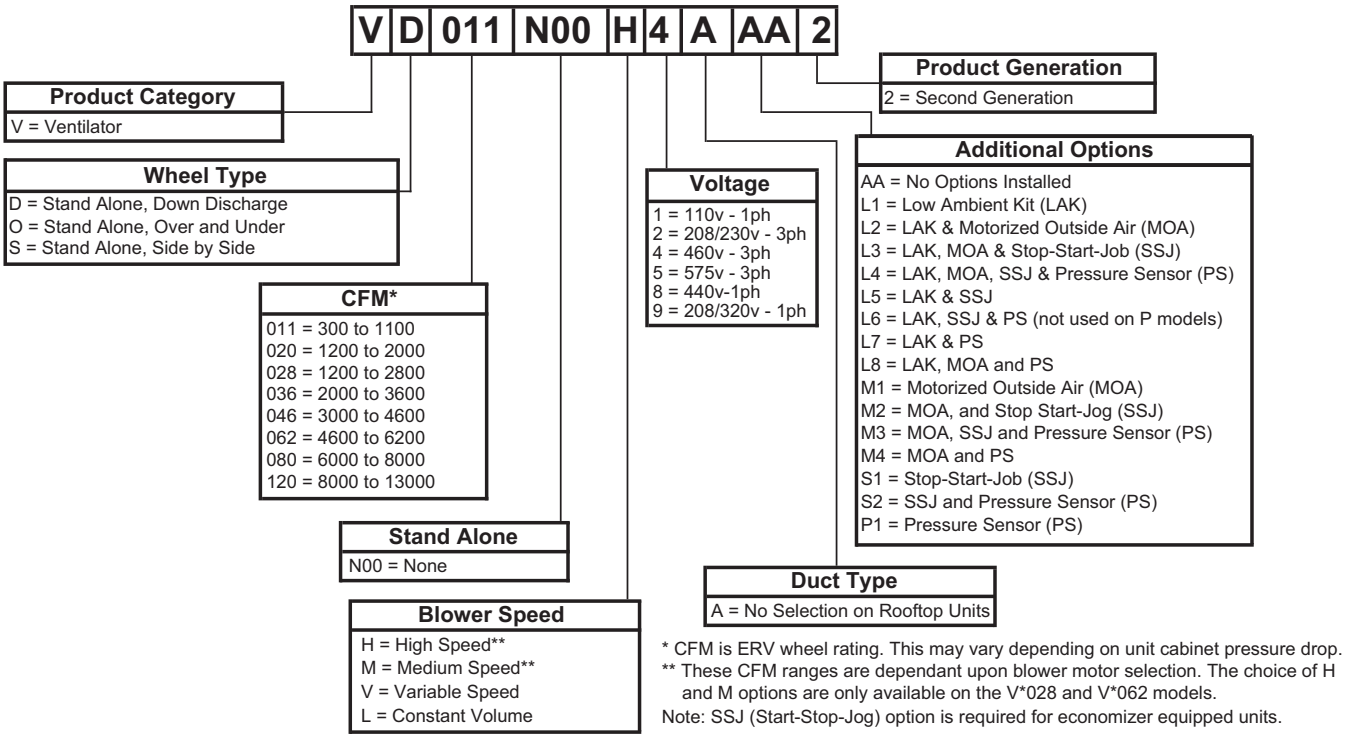
Exhaust						
Blower RPM for VR122, 7.5HP, Barometric Hood						
		External Static Pressure (in water)				
		0	0.5	1	1.5	2
CFM	8000	775	900	1030	1125	1200
	9000	825	945	1055	1150	1240
	10000	875	985	1090	1190	1280
	11000	925	1030	1125	1215	1310
	12000	970	1070	1165	1250	1355
	13000	1015	1110	1200	1280	1360

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	775-1000	Standard Unit
Med	1000-1200	Optional Kit (01-KIT-RM74)
High	1175-1375	Optional Kit (01-KIT-RH74)

UPG UERV STAND ALONE MODEL NOMENCLATURE

UPG UERV Model Nomenclature



* CFM is ERV wheel rating. This may vary depending on unit cabinet pressure drop.
** These CFM ranges are dependant upon blower motor selection. The choice of H and M options are only available on the V*028 and V*062 models.
Note: SSJ (Start-Stop-Jog) option is required for economizer equipped units.

PERFORMANCE - ERV SERIES

Use this table to determine ventilation and size requirements. Table shows ERV Air Flow Range. AHRI certified performance rating provided in specifications and electrical data Effectiveness. "xL", "xM" and "xH" signify low, medium and high speed.

ERV CFM Range	ERV Series
300-1100	D011,O011,S011
1200-2000	D020,O020,S020
1200-2800	D028,O028,S028
2000-3600	D036,O036,S036
3000-4600	D046,O046,S046
4600-6200	D062,O062,S062
6000-8000	D080
8000-13000	D120

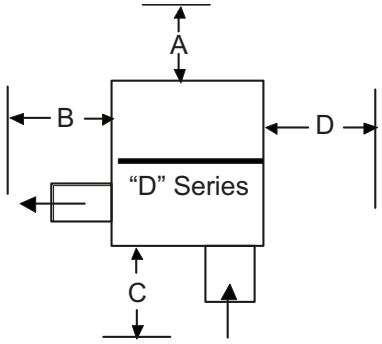
ERV Series Descriptions

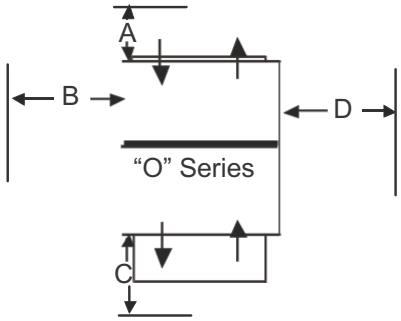
Series	Description
D	Down Discharge Outdoor Application
O	Stand alone outdoor application that attaches to horizontal return air duct in an over and under design.
S	Stand alone outdoor application that attaches to horizontal return air duct in an side by side design.

TABLE 14: FILTER SIZES - STAND ALONE ERV SERIES

Series	Size	Return Filter				Intake Filter			
		Qty	Width	Height	Type	Qty	Width	Height	Type
D	011	1	14	20	2" PLT	1	16.25	10.375	1" ME
	020	2	16	20		1	12.5	20	
	028	2	20	20		1	14.75	32.25	
	036	3	16	20		1	16.5	32.25	
	046	2	24	24		1	20	36	
	062	5	14	20		1/1	20 / 20	36 / 12.5	
	080	6	18	20		2	32.25	21.5	
	120	8	20	20		3	32.25	20.25	
O	011	1	18	25	2" PLT	1	27.5	10	1" ME
	020	2	16	16		1	32.25	18.5	
	028	2	20	20		1	40.25	21.5	
	036	2 / 1	16 / 14	20		1	40.25	21.5	
	046	2	24	24		1	40.25	21.5	
	062	5	14	20		1	40.25	25.5	
S	011	1	14	20	2" PLT	1	16.25	10.375	1" ME
	020	2	16	20		1	12.5	20	
	028	2	20	20		1	14.75	32.25	
	036	3	16	20		1	16.5	32.25	
	046	2	24	24		1	20	36	
	062	5	14	20		1 / 1	20 / 20	36 / 12.5	

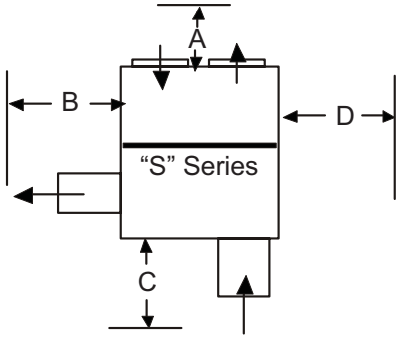
SERVICE CLEARANCES - STAND ALONE SERIES ERVS





Dimension (inches)	"D" Series							
	11	20	28	36	46	62	80	120
A	36	36	36	36	36	36	36	36
B	60	60	60	60	60	60	72	84
C	48	60	60	60	72	72	72	72
D	36	36	48	48	60	60	72	84

Dimension (inches)	"O" Series					
	11	20	28	36	46	62
A	12	12	12	12	12	12
B	36	36	36	36	36	36
C	48	60	60	60	60	60
D	36	36	48	48	60	60



Dimension (inches)	"S" Series					
	11	20	28	36	46	62
A	12	12	12	12	12	12
B	60	60	60	60	60	60
C	48	60	60	60	72	72
D	36	36	48	48	60	60

TABLE 15: SPECIFICATIONS AND ELECTRICAL DATA - 300 THROUGH 1100 CFM ERV'S

Model Numbers		D011 Stand Alone Down Discharge				O011 S/A Over & Under S011 S/A Side by Side			
Line Voltage - 60hz		208/230v 1ph	208/230v 3ph	460v 3ph	575v 3ph	208/230v 1ph	208/230v 3ph	460v 1ph	460v 3ph
Fresh Air Blower	Motor - hp	1.5 / Belt				1.5 / Belt			
	Wheel Size (dia x width) -in	9 x 4				9 x 4			
	Motor Speed -rpm	1725				1725			
	Motor Speed(s)	Adjustable Sheave				Adjustable Sheave			
	Bearing Type	Ball				Ball			
	Full Load Amps	9.1	5.6	2.8	2.0	9.1	5.6	2.8	2.0
	Service Factor	1.15				1.15			
Exhaust Air Blower	Motor - hp Stationary	1.5 / Belt				1.5 / Belt			
	Wheel Size (dia x width) -in	9 x 4				9 x 4			
	Motor Speed -rpm	1725				1725			
	Motor Speed(s)	Adjustable Sheave				Adjustable Sheave			
	Bearing Type	Ball				Ball			
	Full Load Amps-Stationary	9.1	5.6	2.8	2.0	9.1	5.6	2.8	2.0
	Service Factor	1.15				1.15			
Wheel Electrical Data	Potential Volts	208 - 230				208 - 230			
	Motor Speed -rpm	1050				1050			
	Full Load Amps	0.3				0.3			
Total Electrical	MCA - Stationary	20.8	12.9	6.6	4.8	20.8	12.9	6.6	4.8
	OCPD - Stationary	30	15	9	7	30	15	9	7
Wheel Data	Wheel Depth - in	3				3			
	Wheel Diameter - in	25.3				25.3			
	Construction / Media	Segmented Pies/Polymeric				Segmented Pies/Polymeric			
Curb	Curb Hgt - in	14				14			
Weights	Shipping Weight - lbs. (kg)	318				318			
	Net Weight - lbs. (kg)	245				245			

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	76%	68%	73%
	75% Airflow Heating	81%	73%	78%
	100% Airflow Cooling	76%	68%	72%
	75% Airflow Cooling	81%	73%	76%
Net Effectiveness	100% Airflow Heating	76%	68%	73%
	75% Airflow Heating	81%	73%	78%
	100% Airflow Cooling	76%	68%	72%
	75% Airflow Cooling	81%	73%	76%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	900 @ 1.0Δ
EATR - -1.00 H.O	9.30%
EATR - 0.00 H.O	0.70%
EATR - +1.00 H.O	0.00%
OACF - -1.00 H.O	0.97
OACF - 0.00 H.O	1.19
OACF - +1.00 H.O	1.34

TABLE 16: SPECIFICATIONS AND ELECTRICAL DATA - 1200 THROUGH 2000 CFM ERV'S

Model Numbers		D020 Stand Alone Down Discharge			O020 S/A Over and Under S020 S/A Side by Side		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp	2 / Belt			2 / Belt		
	Wheel Size (dia x width) -in	9 x 9			9 x 9		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	6.0	2.6	2.4	6.0	2.6	2.4
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp Stationary	2 / Belt			2 / Belt		
	Wheel Size (dia x width) -in	9 x 9			9 x 9		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	6.0	2.6	2.4	6.0	2.6	2.4
	Service Factor	1.15			1.15		
Wheel Electrical Data	Potential Volts	208 - 230			208 - 230		
	Motor Speed -rpm	1050			1050		
	Full Load Amps	0.3			0.3		
Total Electrical	MCA - Stationary	13.8	6.2	5.7	13.8	6.2	5.7
	OCPD - Stationary	20	9	8	20	9	8
Wheel Data	Wheel Depth - in	3			3		
	Wheel Diameter - in	30.346			30.346		
	Construction / Media	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Hgt - in	14			14		
Weights	Shipping Weight - lbs. (kg)	425			425		
	Net Weight - lbs. (kg)	345			345		

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	61%	65%
	75% Airflow Heating	72%	67%	71%
	100% Airflow Cooling	68%	61%	64%
	75% Airflow Cooling	72%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	61%	65%
	75% Airflow Heating	72%	67%	71%
	100% Airflow Cooling	68%	61%	64%
	75% Airflow Cooling	72%	67%	70%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	1600 @ .95Δ
EATR - -1.00 H$_2$O	7.80%
EATR - 0.00 H$_2$O	0.40%
EATR - +1.00 H$_2$O	0.00%
OACF - -1.00 H$_2$O	0.97
OACF - 0.00 H$_2$O	1.16
OACF - +1.00 H$_2$O	1.29

TABLE 17: SPECIFICATIONS AND ELECTRICAL DATA - 1200 THROUGH 2800 CFM ERV'S

Model Numbers		D028 Stand Alone Down Discharge			O028S/A Over and Under S028 S/A Side by Side		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp / type	3 / Belt			3 / Belt		
	Wheel Size (dia x width) -in	10 x 10			10 x 10		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	9.4	4.3	3.2	9.4	4.3	3.2
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp Stationary	3 / Belt			3 / Belt		
	Wheel Size (dia x width) -in	10 x 10			10 x 10		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	9.4	4.3	3.2	9.4	4.3	3.2
	Service Factor	1.15			1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.05			0.05		
	Potential Volts	200 / 208 - 230			200 / 208 - 230		
	Motor Speed -rpm	825			825		
	Full Load Amps	0.6			0.6		
Total Electrical	MCA - Stationary	21.8	10.3	7.8	21.8	10.3	7.8
	OCPD - Stationary	30	12	10	30	12	10
Wheel Data	Wheel Depth x Dia - in	3 x 37.759			3 x 37.759		
	Construction / Media Type	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Height - in	14			14		
Weights	Shipping Weight - lbs. (kg)	470			470		
	Net Weight - lbs. (kg)	395			395		

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	2600 @ .95Δ
EATR - -1.00 H_2O	6.10%
EATR - 0.00 H_2O	0.40%
EATR - +1.00 H_2O	0.00%
OACF - -1.00 H_2O	0.99
OACF - 0.00 H_2O	1.13
OACF - +1.00 H_2O	1.23

TABLE 18: SPECIFICATIONS AND ELECTRICAL DATA - 2000 THROUGH 3600 CFM ERV'S

Model Numbers		D036 Stand Alone Down Discharge			O036 S/A Over and Under S036 S/A Side by Side		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp / type	3 / Belt			3 / Belt		
	Wheel Size (dia x width) -in	12 x 9			12 x 9		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	9.4	4.3	3.2	9.4	4.3	3.2
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp Stationary	3 / Belt			3 / Belt		
	Wheel Size (dia x width) -in	12 x 9			12 x 9		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	9.4	4.3	3.2	9.4	4.3	3.2
	Service Factor	1.15			1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.17			0.17		
	Potential Volts	200 / 208 - 230			200 / 208 - 230		
	Motor Speed -rpm	1075			1075		
	Full Load Amps	1.2			1.2		
Total Electrical	MCA - Stationary	22.4	10.9	8.4	22.4	10.9	8.4
	OCPD - Stationary	30	15	10	30	15	10
Wheel Data	Wheel Depth x Diameter - in	3 x 41.825			3 x 41.825		
	Construction / Media Type	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Height - in	14			14		
Weights	Shipping Weight - lbs. (kg)	571			571		
	Net Weight - lbs. (kg)	475			475		

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	3100 @ .9Δ
EATR - -1.00 H_2O	4.90%
EATR - 0.00 H_2O	1.30%
EATR - +1.00 H_2O	0.30%
OACF - -1.00 H_2O	0.99
OACF - 0.00 H_2O	1.07
OACF - +1.00 H_2O	1.12

TABLE 19: SPECIFICATIONS AND ELECTRICAL DATA - 3000 THROUGH 4600 CFM ERV'S

Model Numbers		D046 Stand Alone Down Discharge			O046 S/A Over and Under S046 S/A Side by Side		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/ 230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp / type	5 / Belt			5 / Belt		
	Wheel Size (dia x width) -in	12 x 12			12 x 12		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	14.8	7.0	5.1	14.8	7.0	5.1
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp Stationary	5 / Belt			5 / Belt		
	Wheel Size (dia x width) -in	12 x 12			12 x 12		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	14.8	7.0	5.1	14.8	7.0	5.1
	Service Factor	1.15			1.15		
Enthalpy Wheel Electrical Data	Motor - hp (1 phase)	0.17			0.17		
	Potential Volts	200 / 208 - 230			200 / 208 - 230		
	Motor Speed -rpm	1075			1075		
	Full Load Amps	1.2			1.2		
Total Electrical	MCA - Stationary	34.5	17.0	12.7	34.5	17.0	12.7
	OCPD - Stationary	40	25	15	40	25	15
Wheel Data	Wheel Depth x Diameter - in	3 x 46.776			3 x 46.776		
	Construction / Media Type	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Height - in	14			14		
Weights	Shipping Weight - lbs. (kg)	920			920		
	Net Weight - lbs. (kg)	805			805		

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	3900 @ .95Δ
EATR - -1.00 H$_2$O	4.40%
EATR - 0.00 H$_2$O	1.10%
EATR - +1.00 H$_2$O	0.20%
OACF - -1.00 H$_2$O	0.99
OACF - 0.00 H$_2$O	1.06
OACF - +1.00 H$_2$O	1.11

TABLE 20: SPECIFICATIONS AND ELECTRICAL DATA - 4600 THROUGH 6200 CFM ERV'S

Model Numbers		D062 Stand Alone Down Discharge			O062 S/A Over and Under S062 S/A Side by Side		
CFM Range		4600-6200 CFM			4600-6200 CFM		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp / type	5 / belt			5 / belt		
	Wheel Size (dia x width) -in	15 x 15			15 x 15		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	14.8	7.0	5.1	14.8	7.0	5.1
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp Stationary	5 / Belt			5 / Belt		
	Wheel Size (dia x width) -in	12 x 12			12 x 12		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	14.8	7.0	5.1	14.8	7.0	5.1
	Service Factor	1.15			1.15		
Enthalpy Wheel Electrical Data	Motor - hp (1 phase)	0.17			0.17		
	Potential Volts	200 / 208 - 230			200 / 208 - 230		
	Motor Speed -rpm	1075			1075		
	Full Load Amps	1.2			1.2		
Total Electrical	MCA - Stationary	34.5	17.0	12.7	34.5	17.0	12.7
	OCPD - Stationary	40	25	15	40	25	15
Wheel Data	Wheel Depth x Diameter - in	3 x 52.026			3 x 52.026		
	Construction / Media Type	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Height - in	14			14		
Weights	Shipping Weight - lbs. (kg)	1250			1250		
	Net Weight - lbs. (kg)	1075			1075		

AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%

Enthalpy Wheel AHRI Rating Data	
Nominal Airflow CFM	5500 @ .95Δ
EATR - -1.00 H$_2$O	4.00%
EATR - 0.00 H$_2$O	1.00%
EATR - +1.00 H$_2$O	0.20%
OACF - -1.00 H$_2$O	0.99
OACF - 0.00 H$_2$O	1.06
OACF - +1.00 H$_2$O	1.10

TABLE 21: SPECIFICATIONS AND ELECTRICAL DATA - 6000 THROUGH 13000 CFM ERV'S

Model Numbers		D080 Stand Alone Down Discharge			D120 Stand Alone Down Discharge		
Line Voltage - 60hz		208/230v 3ph	460v 3ph	575v 3ph	208/230v 3ph	460v 3ph	575v 3ph
Fresh Air Blower	Motor - hp Stationary	10 / Belt			15 / Belt		
	Wheel Size (dia x width) -in	15 x 15			22 x 15		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps-Stationary	26.8	13.4	10.3	41.0	18.5	15.4
	Service Factor	1.15			1.15		
Exhaust Air Blower	Motor - hp / type	7.5 / Belt			10 / Belt		
	Wheel Size (dia x width) -in	18 x 18			22 x 22		
	Motor Speed -rpm	1725			1725		
	Motor Speed(s)	Adjustable Sheave			Adjustable Sheave		
	Bearing Type	Ball			Ball		
	Full Load Amps	22.4	9.7	7.8	32.6	13.4	10.3
	Service Factor	1.15			1.15		
Enthalpy Wheel Electrical Data	Motor - hp (3 phase)	0.25	0.25	0.33	0.25	0.25	0.33
	Potential Volts	200 / 208 - 230			200 / 208 - 230		
	Motor Speed -rpm	1725			1725		
	Full Load Amps	2.5	1.2	1.4	2.5	1.2	1.4
Total Electrical	MCA - Stationary	63.2	27.7	22.1	86.2	37.7	31.0
	OCPD - Stationary	90	40	35	125	50	45
Wheel Data	Wheel Depth x Diameter - in	3 x 58			3 x 74		
	Construction / Media Type	Segmented Pies/Polymeric			Segmented Pies/Polymeric		
Curb	Curb Height - in	14			14		
Weights	Shipping Weight - lbs. (kg)	2800			3000		
	Net Weight - lbs. (kg)	2600			2800		

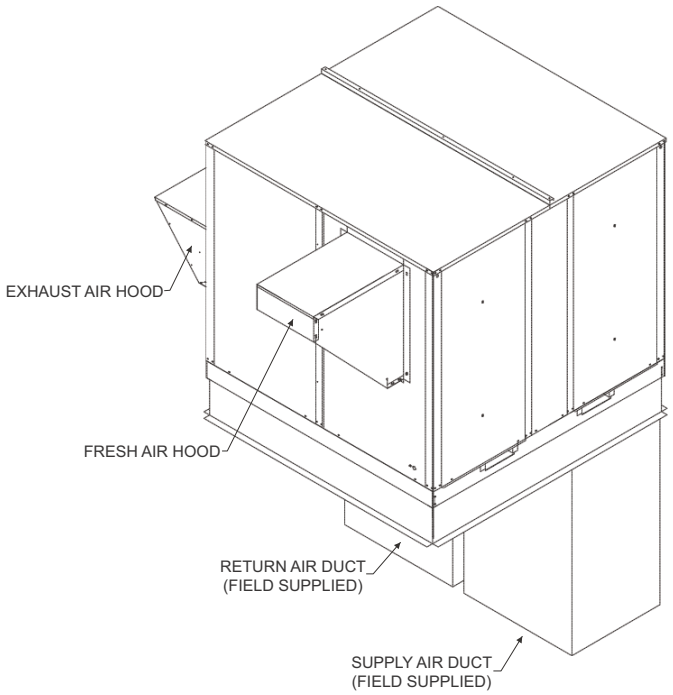
AHRI Certified Ratings

Thermal Ratings @ 0" Pressure Diff.		Sensible	Latent	Total
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	73%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	73%	67%	70%
Enthalpy Wheel AHRI Rating Data				
Nominal Airflow CFM	6600 @ .95		10800 @ .95Δ	
EATR - -1.00 H_2O	4.60%		3.40%	
EATR - 0.00 H_2O	1.90%		1.20%	
EATR - +1.00 H_2O	0.90%		0.40%	
OACF - -1.00 H_2O	0.99		0.99	
OACF - 0.00 H_2O	1.05		1.04	
OACF - +1.00 H_2O	1.09		1.07	

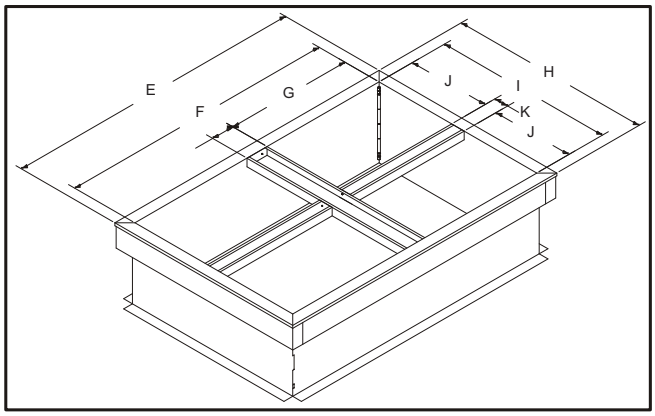
D SERIES STAND ALONE ERV'S FOR DOWN DISCHARGE DUCT ARRANGEMENTS

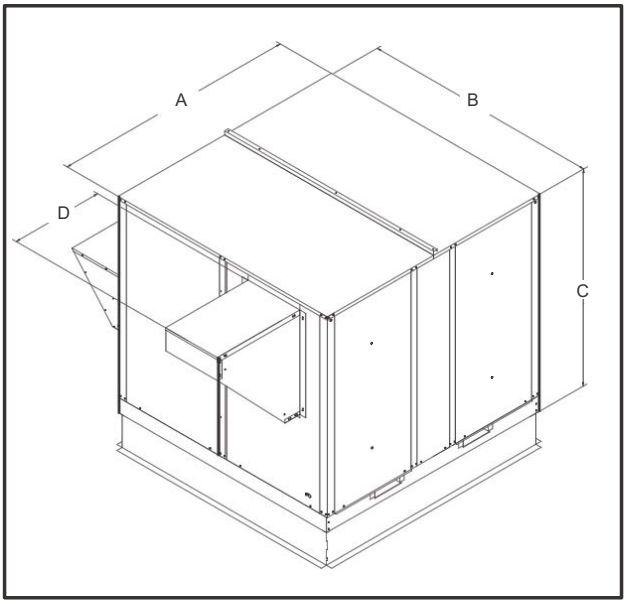
FEATURES AND NOTES

1. Stand alone design allows higher levels of outdoor air to be introduced into the a/c space.
2. Static test ports provided to verify intake and exhaust CFM.
3. Balancing damper(s) field supplied in duct work when connected to ERV.
4. Roof curbs are available for the ERV's.
5. See blower performance charts for airflow at various E.S.P.
6. Filter rack with 2" pleated filters included.



ERV Roof Curbs	
Series	**Model No**
D011	01-2D1-2514
D020	01-2D1-3014
D028	01-2D1-3614
D036	01-2D1-4114
D046	01-2D1-4614
D062	01-2D1-5214
D080	01-201D-5814
D120	01-201D-7414





ERV Data			Dimensional Data										
ERV Series	CFM Range	Duct Size (G x J)	ERV				Roof Curb						
			A	B	C	D	E	F	G	H	I	J	K
D011	300-1100	17.00 x 11.38	44.75	32.13	33.50	14.38	43.00	39.00	17.50	30.25	26.25	11.88	2.50
D020	1200-2000	21.88 x 14.00	54.38	37.25	37.50	17.50	52.75	48.75	22.38	35.50	31.50	14.50	2.50
D028	1200-2800	20.25 x 17.00	52.25	42.63	43.56	25.50	49.50	45.50	20.75	41.00	37.00	17.50	2.00
D036	2000-3600	23.38 x 17.38	60.00	46.69	57.37	25.50	55.75	51.75	23.88	41.81	37.81	17.91	2.00
D046	3000-4600	23.38 x 20.38	60.00	52.69	57.37	28.06	55.75	51.75	23.88	47.81	43.81	20.91	2.00
D062	4600-6200	29.38 x 30.00	72.00	70.88	63.63	37.75	67.75	63.75	29.88	66.00	62.00	30.50	2.00
D080	6000-8000	38.75 x 35.38	101.38	78.38	71.34	21.75	99.75	95.75	38.75	76.75	72.75	35.38	2.00
D120	8000-13000	40.00 x 44.50	120.38	88.38	86.63	28.50	118.50	114.50	44.88	86.50	82.50	40.25	2.00

TABLE 22: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR D011 & D020

Blower RPM for D011

SUPPLY Mist Eliminator Filter in Intake Hood (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1175	1350	1450	1605	1730
500	N/A	1170	1340	1540	1655	1725	1840
700	1295	1425	1600	1625	1795	1960	2035
900	1540	1660	1720	1790	2030	2110	2195
1100	1785	1915	2025	2185	N/A	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1030	1225	N/A	N/A	N/A
500	N/A	1025	1180	1265	1425	1535	N/A
700	1120	1190	1340	1445	1540	1645	1720
900	1285	1525	1500	1575	1670	1785	1865
1100	1570	1665	1670	1775	1860	1920	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	1000-1300	Standard Unit
Medium	1300-1565	Optional Kit
High	1750-2200	Optional Kit

Blower RPM for D020

SUPPLY Mist Eliminator Filter in Intake Hood (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1055	1135	1295	1420	1540	1650	1725
1400	1140	1240	1340	1490	1600	1690	1795
1600	1200	1330	1460	1565	1645	1740	1830
1800	1320	1405	1525	1615	1705	1785	1885
2000	1415	1515	1605	1690	1775	1875	1960

EXHAUST Barometric Hood, 2" Pleated Filters (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1010	1195	1350	1445	1580	1685	1735
1400	1125	1315	1435	1545	1620	1730	1800
1600	1185	1370	1500	1610	1695	1790	1965
1800	1305	1485	1600	1685	1781	1955	2030
2000	1410	1550	1670	1765	1855	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	1000-1300	Standard Unit
Medium	1300-1700	Optional Kit
High	1700-2080	Optional Kit

TABLE 23: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR D028 & D036

Blower RPM for D028

SUPPLY							
Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	N/A	790	960	1110	1210	1315	1380
1600	750	900	1005	1145	1230	1365	1410
2000	900	1005	1105	1210	1275	1400	1450
2400	1005	1125	1210	1275	1365	1450	1500
2800	1125	1230	1315	1380	1450	1535	1600

EXHAUST							
Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	750	885	1015	1145	1260	1350	1485
1600	870	1015	1125	1215	1325	1410	1500
2000	1015	1145	1240	1345	1410	1485	1560
2400	1125	1250	1345	1430	1500	1575	1630
2800	1250	1410	1485	1520	1630	1650	1675

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	750-975	Standard Unit
Medium	1008-1314	Optional Kit
High	1311-1708	Optional Kit

Blower RPM for D036

SUPPLY							
Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	725	825	900	1000	1070	1180	1250
2400	800	900	1000	1070	1160	1250	1275
2800	900	1000	1070	1160	1250	1275	1340
3200	1000	1070	1160	1250	1275	1340	1400
3600	1055	1180	1250	1300	1360	N/A	N/A

EXHAUST							
Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	750	865	950	1030	1100	1200	1265
2400	820	950	1035	1100	1200	1265	1300
2800	925	1035	1150	1200	1265	1315	1350
3200	1035	1160	1215	1265	1325	1350	1390
3600	1100	1215	1300	1350	1390	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	725-975	Standard Unit
Medium	1000-1315	Optional Kit
High	1215-1425	Optional Kit

TABLE 24: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR D046 & D062

Blower RPM for D046

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	900	1030	1100	1165	1240	1285	1350
3400	975	1085	1175	1240	1290	1350	1400
3800	1070	1175	1240	1290	1350	1400	1465
4200	1165	1240	1320	1350	1430	1465	1515
4600	1240	1320	1375	1430	1500	1515	1580

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	955	1100	1160	1245	1280	1360	1425
3400	1055	1185	1245	1300	1375	1425	1480
3800	1160	1300	1360	1400	1425	1530	1585
4200	1245	1375	1450	1480	1500	1585	1650
4600	1360	1450	1500	1585	1600	1650	1700

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	780-1020	Standard Unit
Medium	1000-1315	Optional Kit
High	1315-1700	Optional Kit

Blower RPM for D062

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	815	900	975	1045	1085	1125	1175
5000	880	940	1015	1060	1135	1175	1215
5400	915	975	1045	1125	1150	1195	1250
5800	975	1045	1085	1175	1250	1260	N/A
6200	1000	1075	1165	1200	N/A	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	825	915	1000	1025	1100	1140	1170
5000	890	975	1025	1100	1140	1170	1240
5400	925	1000	1085	1140	1170	1240	1280
5800	975	1025	1140	1170	1240	N/A	N/A
6200	1025	1120	1170	N/A	N/A	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	820-1000	Standard Unit
Medium	1000-1200	Optional Kit
High	1175-1375	Optional Kit

TABLE 25: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR D080 & D120

Blower RPM for D080

SUPPLY Mist Eliminator Filter in Intake Hood (10HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
6000	737	794	851	908	961	1012	1061
6400	786	839	893	947	998	1047	1094
6800	836	886	937	987	1036	1083	1129
7200	885	931	979	1027	1074	1119	1163
7600	934	978	1024	1069	1114	1159	1200
8000	983	1025	1068	1111	1154	1196	1237

EXHAUST Barometric Hood, 2" Pleated Filters (7.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
6000	599	660	716	769	818	866	911
6400	639	695	748	798	846	892	935
6800	679	733	783	831	877	921	963
7200	719	769	817	863	907	949	990
7600	759	808	854	897	940	980	1020
8000	799	845	889	931	972	1011	1049

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
	Low	Standard Unit
	Medium	Optional Kit
	High	Optional Kit

Blower RPM for D120

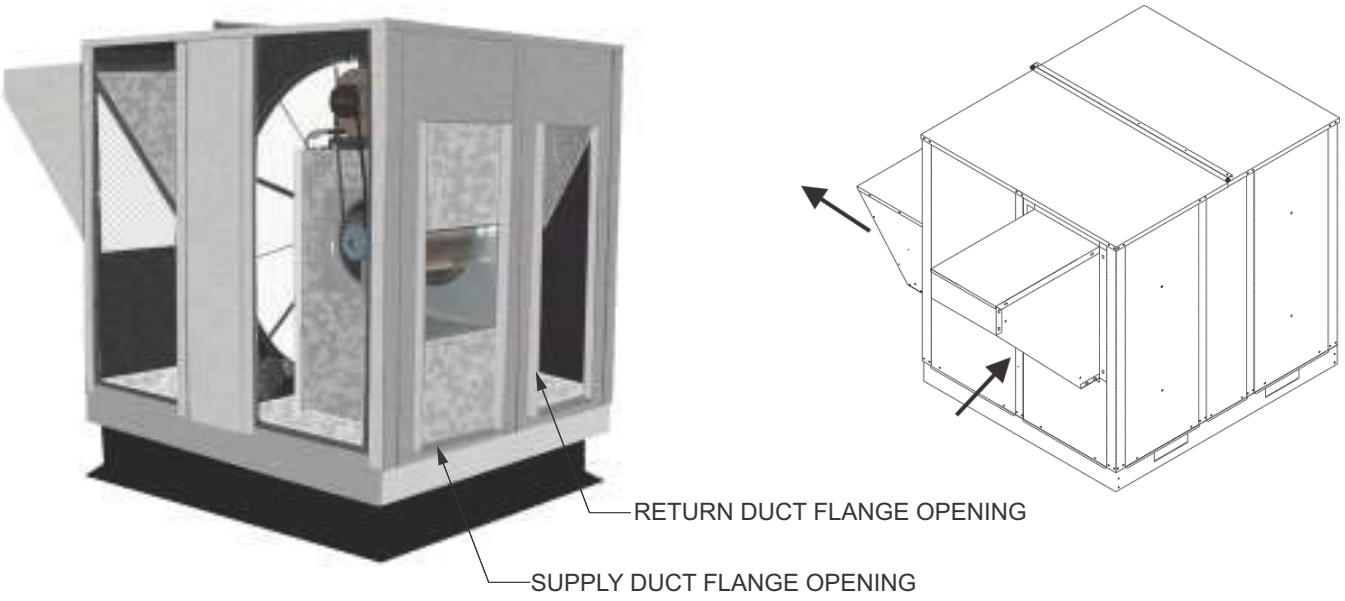
SUPPLY Mist Eliminator Filter in Intake Hood (15HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
8000	427	470	512	552	591	630	667
8800	469	509	547	584	621	656	691
9600	512	548	583	618	651	684	717
10400	555	589	621	653	684	715	746
11200	597	629	659	689	718	747	776
12000	640	670	698	726	754	781	808

EXHAUST Barometric Hood, 2" Pleated Filters (15HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
8000	437	480	521	551	600	639	676
8800	481	520	558	595	631	665	701
9600	525	561	596	630	663	696	728
10400	569	602	634	665	657	727	758
11200	612	643	674	703	732	761	789
12000	656	685	713	741	768	795	822

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

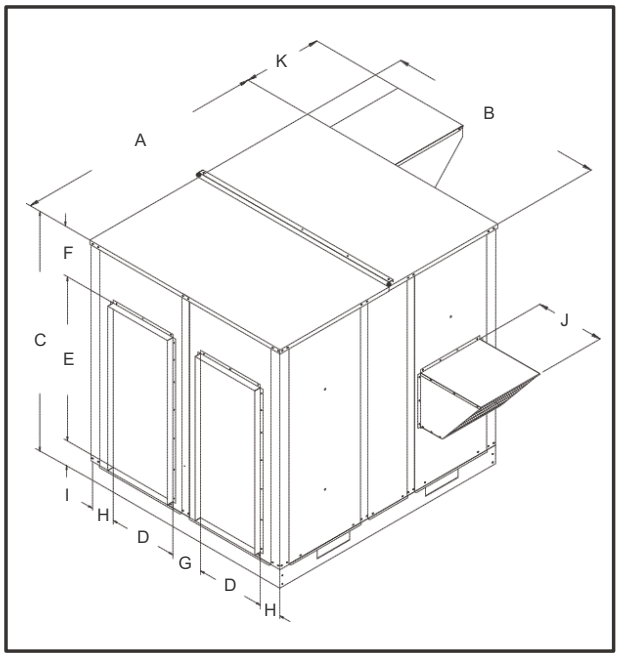
RPM Range		
	Low	Standard Unit
	Medium	Optional Kit
	High	Optional Kit

S SERIES STAND ALONE ERV'S FOR SIDE BY SIDE DUCT ARRANGEMENTS



FEATURES AND NOTES

1. Stand alone design allows higher levels of outdoor air to be introduced into the conditioned space.
2. Static test ports provided to verify intake and exhaust CFM.
3. Balancing damper(s) is field provided when connected to ductwork. System may not operate properly without balancing damper.
4. Roof curbs are available for the ERV's.
5. See blower performance charts for airflow at various E.S.P.
6. Filter rack with 2" pleated filters included. Found in return air section.



ERV Roof Curbs	
Series	**Model No**
S011	01-2D1-2514
S020	01-2D1-3014
S028	01-2D1-3614
S036	01-2D1-4114
S046	01-2D1-4614
S062	01-2D1-5214

ERV Data		Dimensional Data										
ERV Series	**CFM Range**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
S011	300-1100	44.75	32.13	33.50	11.00	27.00	4.00	4.25	2.88	2.50	20.75	14.38
S020	1200-2000	54.38	37.25	37.50	12.00	30.00	5.87	5.13	4.06	1.63	20.75	17.50
S028	1200-2800	52.25	42.63	43.56	14.00	32.00	8.69	5.25	4.25	2.88	20.75	25.50
S036	2000-3600	60.00	46.69	57.37	16.50	39.50	12.00	5.50	4.05	5.88	20.75	25.50
S046	3000-4600	60.00	52.69	57.37	16.50	39.50	12.00	8.69	5.50	5.88	20.75	28.06

TABLE 26: AIRFLOW PERFORMANCE - SIDE BY SIDE DUCT CONFIGURATION FOR S011 & S020

Blower RPM for S011

SUPPLY Mist Eliminator Filter in Intake Hood (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1020	1205	1365	1480	1590
500	N/A	1015	1200	1320	1460	1565	1670
700	990	1190	1315	1455	1560	1665	1715
900	1150	1310	1450	1555	1660	1680	1795
1100	1305	1440	1550	1655	1740	1815	1895

EXHAUST Barometric Hood, 2" Pleated Filters (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1150	1285	1415	1515	1640
500	N/A	1145	1275	1410	1510	1545	1720
700	1140	1270	1405	1505	1590	1715	1815
900	1320	1435	1585	1665	1705	1810	1930
1100	1495	1580	1660	1755	1880	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	100-1300	Standard Unit
Medium	1300-1700	Optional Kit
High	1750-2200	Optional Kit

Blower RPM for S020

SUPPLY Mist Eliminator Filter in Intake Hood (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1065	1285	1375	1415	1495	1580	1685
1400	1140	1330	1410	1440	1555	1660	1760
1600	1290	1400	1480	1545	1670	1745	1835
1800	1395	1470	1540	1665	1735	1800	1880
2000	1460	1530	1650	1725	1795	1870	1960

EXHAUST Barometric Hood, 2" Pleated Filters (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1175	1290	1430	1520	1680	1765	1850
1400	1245	1425	1515	1675	1755	1830	1920
1600	1400	1505	1670	1750	1825	1910	1980
1800	1495	1660	1740	1820	1900	1975	2090
2000	1645	1730	1815	1895	1965	2080	2170

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	100-1300	Standard Unit
Medium	1300-1750	Optional Kit
High	1750-2200	Optional Kit

TABLE 27: AIRFLOW PERFORMANCE - SIDE BY SIDE DUCT CONFIGURATION FOR S028 & S036

Blower RPM for S028

SUPPLY Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	N/A	955	1070	1210	1370	1465	1550
1600	N/A	1065	1205	1305	1460	1540	1595
2000	1060	1200	1290	1445	1530	1585	1680
2400	1190	1335	1440	1490	1575	1670	1755
2800	1300	1460	1550	1645	1705	1750	1800

EXHAUST Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	N/A	N/A	1025	1170	1270	1355	1400
1600	N/A	1020	1155	1240	1330	1390	1490
2000	1015	1150	1235	1325	1380	1475	1590
2400	1140	1285	1365	1420	1510	1595	1640
2800	1280	1345	1455	1540	1575	1670	1745

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	950-1320	Standard Unit
Medium	1325-1565	Optional Kit
High	1570-1880	Optional Kit

Blower RPM for S036

SUPPLY Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	815	925	1020	1105	1155	1255	1325
2400	920	1060	1130	1215	1250	1355	1385
2800	1010	1140	1240	1285	1370	1425	1470
3200	1125	1235	1340	1385	1455	1465	N/A
3600	1225	1375	1440	1460	1500	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	755	890	970	1060	1125	1215	1280
2400	985	1035	1085	1140	1240	1275	1325
2800	1020	1115	1175	1230	1270	1335	1370
3200	1105	1200	1225	1285	1300	1390	1430
3600	1155	1265	1295	1335	1385	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	700-1025	Standard Unit
Medium	1030-1305	Optional Kit
High	1325-1575	Optional Kit

TABLE 28: AIRFLOW PERFORMANCE - SIDE BY SIDE DUCT CONFIGURATION FOR S046 & S062

Blower RPM for S046

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	965	1085	1150	1230	1295	1345	1420
3400	1035	1145	1250	1290	1335	1415	1475
3800	1120	1245	1285	1315	1440	1470	1535
4200	1215	1305	1355	1430	1465	1530	1595
4600	1300	1375	1450	1460	1540	1590	1650

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	1010	1105	1195	1255	1300	1375	1415
3400	1100	1190	1250	1320	1370	1410	1480
3800	1185	1245	1360	1410	1440	1475	1540
4200	1240	1355	1425	1465	1530	1590	1630
4600	1345	1410	1485	1520	1585	1650	1700

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	780-1020	Standard Unit
Medium	1000-1315	Optional Kit
High	1315-1700	Optional Kit

Blower RPM for S062

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	795	900	1030	1075	1160	1220	1255
5000	855	920	1070	1130	1190	1250	1275
5400	880	950	1095	1155	1245	1270	1290
5800	915	1035	1115	1175	1255	1280	N/A
6200	985	1080	1135	1225	1265	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	705	885	985	1045	1100	1155	1215
5000	825	950	1025	1095	1150	1210	1245
5400	875	980	1080	1140	1190	1240	1275
5800	935	995	1130	1180	1230	N/A	N/A
6200	985	1095	1165	N/A	N/A	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

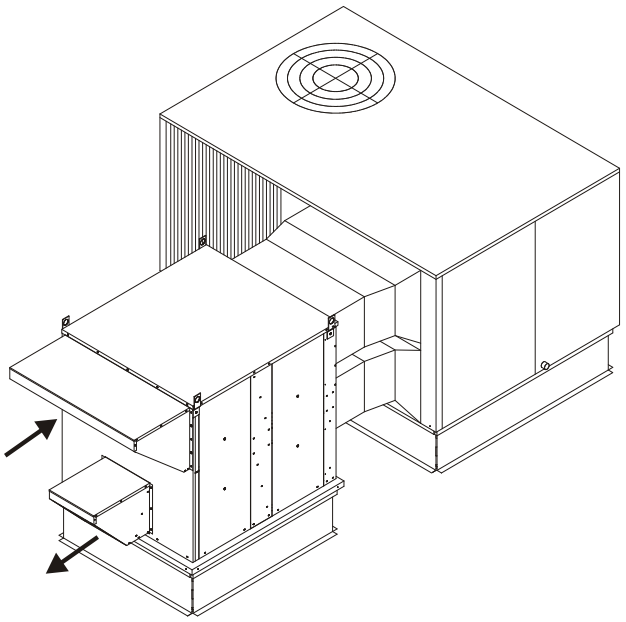
	RPM Range	
Low	700-900	Standard Unit
Medium	900-1100	Optional Kit
High	1100-1300	Optional Kit

O SERIES STAND ALONE ERV'S FOR OVER AND UNDER DUCT ARRANGEMENTS

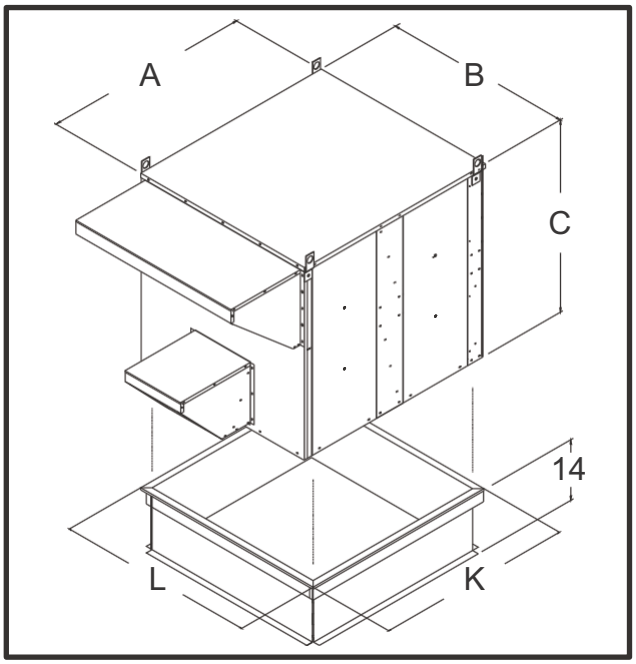
FEATURES AND NOTES

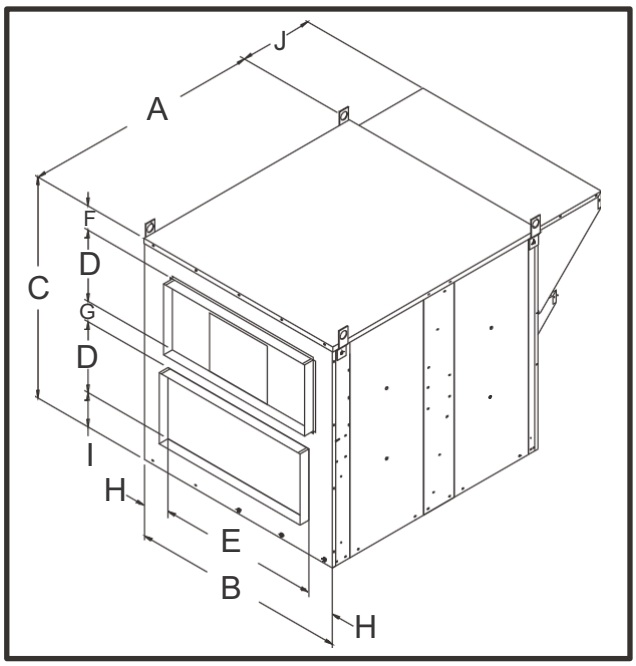
1. Stand alone design allows higher levels of outdoor air to be introduced into the conditioned space.
2. Static test ports provided to verify intake and exhaust CFM.
3. Balancing damper(s) is field provided when connected to ductwork. System may not operate properly without balancing damper.
4. Roof curbs are available for the ERV's.
5. See blower performance charts for airflow at various E.S.P.
6. Filter rack with 2" pleated filters included. Found in return air section.

ERV Roof Curbs	
Series	**Model No**
O011	01-2O1-2514
O020	01-2D1-3014
O028	01-2O1-3614
O036	01-2D1-4114
O046	01-2D1-4614
O062	01-2O1-5214



ERV with Horizontal Ductwork
(balancing damper(s) field supplied)





ERV Data		Dimensional Data											
ERV Series	**CFM Range**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
O011	300-1100	56.75	32.13	39.50	11.00	27.00	6.50	10.00	2.56	1.00	11.00	55.00	30.25
O020	1200-2000	54.38	37.25	37.50	12.00	30.00	8.00	4.00	3.63	1.50	20.32	52.75	35.50
O028	1200-2800	60.00	42.63	43.56	14.00	32.00	9.56	4.50	5.31	1.50	18.32	49.50	41.00
O036	2000-3600	60.00	46.69	57.37	16.50	39.50	12.13	6.38	3.59	5.88	18.32	55.75	41.81
O046	3000-4600	60.00	52.69	57.37	16.50	39.50	12.13	6.38	6.59	5.88	18.32	55.75	47.81
O062	4600-6200	72.00	70.88	63.63	19.50	39.50	12.13	6.50	15.69	5.88	18.32	67.75	66.00

TABLE 29: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR O011 & O020

Blower RPM for O011

SUPPLY Mist Eliminator Filter in Intake Hood (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1175	1350	1450	1605	1730
500	N/A	1170	1340	1540	1655	1725	1840
700	1295	1425	1600	1625	1795	1960	2035
900	1540	1660	1720	1790	2030	2110	2195
1100	1785	1915	2025	2185	N/A	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (1.5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
300	N/A	N/A	1030	1225	N/A	N/A	N/A
500	N/A	1025	1180	1265	1425	1535	N/A
700	1120	1190	1340	1445	1540	1645	1720
900	1285	1525	1500	1575	1670	1785	1865
1100	1570	1665	1670	1775	1860	1920	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	1000-1300	Standard Unit
Medium	1300-1700	Optional Kit
High	1750-2200	Optional Kit

Blower RPM for O020

SUPPLY Mist Eliminator Filter in Intake Hood (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1055	1135	1295	1420	1540	1650	1725
1400	1140	1240	1340	1490	1600	1690	1795
1600	1200	1330	1460	1565	1645	1740	1830
1800	1320	1405	1525	1615	1705	1785	1885
2000	1415	1515	1605	1690	1775	1875	1960

EXHAUST Barometric Hood, 2" Pleated Filters (2HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	1010	1195	1350	1445	1580	1685	1735
1400	1125	1315	1435	1545	1620	1730	1800
1600	1185	1370	1500	1610	1695	1790	1965
1800	1305	1485	1600	1685	1781	1955	2030
2000	1410	1550	1670	1765	1855	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	1000-1300	Standard Unit
Medium	1300-1700	Optional Kit
High	1700-2080	Optional Kit

TABLE 30: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR O028 & O036

Blower RPM for O028

SUPPLY Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	N/A	790	960	1110	1210	1315	1380
1600	750	900	1005	1145	1230	1365	1410
2000	900	1005	1105	1210	1275	1400	1450
2400	1005	1125	1210	1275	1365	1450	1500
2800	1125	1230	1315	1380	1450	1535	1600

EXHAUST Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
1200	750	885	1015	1145	1260	1350	1485
1600	870	1015	1125	1215	1325	1410	1500
2000	1015	1145	1240	1345	1410	1485	1560
2400	1125	1250	1345	1430	1500	1575	1630
2800	1250	1410	1485	1520	1630	1650	1675

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	725-975	Standard Unit
Medium	1008-1314	Optional Kit
High	13115-1708	Optional Kit

Blower RPM for O036

SUPPLY Mist Eliminator Filter in Intake Hood (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	725	825	900	1000	1070	1180	1250
2400	800	900	1000	1070	1160	1250	1275
2800	900	1000	1070	1160	1250	1275	1340
3200	1000	1070	1160	1250	1275	1340	1400
3600	1055	1180	1250	1300	1360	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (3HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
2000	750	865	950	1030	1100	1200	1265
2400	820	950	1035	1100	1200	1265	1300
2800	925	1035	1150	1200	1265	1315	1350
3200	1035	1160	1215	1265	1325	1350	1390
3600	1100	1215	1300	1350	1390	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

	RPM Range	
Low	725-975	Standard Unit
Medium	1000-1315	Optional Kit
High	1215-1425	Optional Kit

TABLE 31: AIRFLOW PERFORMANCE - DOWNFLOW CONFIGURATION FOR O046 & O062

Blower RPM for O046

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	900	1030	1100	1165	1240	1285	1350
3400	975	1085	1175	1240	1290	1350	1400
3800	1070	1175	1240	1290	1350	1400	1465
4200	1165	1240	1320	1350	1430	1465	1515
4600	1240	1320	1375	1430	1500	1515	1580

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
3000	955	1100	1160	1245	1280	1360	1425
3400	1055	1185	1245	1300	1375	1425	1480
3800	1160	1300	1360	1400	1425	1530	1585
4200	1245	1375	1450	1480	1500	1585	1650
4600	1360	1450	1500	1585	1600	1650	1700

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	780-1020	Standard Unit
Medium	1000-1315	Optional Kit
High	1315-1700	Optional Kit

Blower RPM for O062

SUPPLY Mist Eliminator Filter in Intake Hood (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	815	900	975	1045	1085	1125	1175
5000	880	940	1015	1060	1135	1175	1215
5400	915	975	1045	1125	1150	1195	1250
5800	975	1045	1085	1175	1250	1260	N/A
6200	1000	1075	1165	1200	N/A	N/A	N/A

EXHAUST Barometric Hood, 2" Pleated Filters (5HP)							
CFM	External Static Pressure (in water)						
	0	0.25	0.5	0.75	1	1.25	1.5
4600	825	915	1000	1025	1100	1140	1170
5000	890	975	1025	1100	1140	1170	1240
5400	925	1000	1085	1140	1170	1240	1280
5800	975	1025	1140	1170	1240	N/A	N/A
6200	1025	1120	1170	N/A	N/A	N/A	N/A

Notes:
1. Drive losses included in the above table
2. Performance can vary depending on ambient conditions
3. Blower RPMs are for reference only

RPM Range		
Low	820-1000	Standard Unit
Medium	1000-1200	Optional Kit
High	11751375	Optional Kit

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers, and mechanical contractors.

GENERAL

Furnish and install _____ mechanical cooling system, complete with a Unitized Energy Recovery Ventilator (UERV).

APPROVALS

The Unitized Energy Recovery Ventilator will contain an energy recovery component rated in accordance with AHRI/ ANSI Standard 1060-2005 with ratings certified by AHRI.

Cabinet

UERV shall be designed to attach directly to the a/c (rooftop, upflow, horizontal) unit. It shall be G90 galvanized material with a powdered enamel paint finish electrostatically bonded to the metal. Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connections. Lifting devices will be provided for rigging. Test ports shall be provided so airflow can be measured across the energy recovery wheel.

Intake Air Blower (direct drive)

UERV shall contain a centrifugal blower. All UERV's will be equipped with direct drive PSC blower motors. The motor will be multiple speed and will be individually controlled. Airflow will also be adjustable by means of a damper on the intake air opening. Blowers and motors will be removable through means of a connecting plug for ease of servicing.

Intake Air Blower (belt drive)

UERV shall contain a centrifugal blower. It shall have ball bearings and adjustable belt drive. Motor mount base shall permit ease of motor changeover and belt tension adjustment. On pivoting wheel models, supply blower will be de-energized during economizer operation. (Except for VR074 and VR122.)

Exhaust Air Blower (direct drive)

UERV shall contain a centrifugal blower. All UERV's will be equipped with direct drive PSC blower motors. The motor will be multiple speed and shall be individually controlled. Blowers and motors will be removable through means of a connecting plug for ease of servicing. On pivoting wheel models, blower shall be sized to provide power exhaust during economizer operation.

Exhaust Air Blower (belt drive)

UERV shall contain a centrifugal blower. It shall have ball bearings and adjustable belt drive. Motor mount base shall permit ease of motor changeover and belt tension adjustment. On pivoting wheel models, exhaust blowers shall be sized to provide power exhaust during economizer operation. Where single blowers cannot provide adequate exhaust, two blowers will be utilized. One blower is energized during energy recovery mode, and both blowers are energized during economizer mode.

Energy Recovery Wheel

The energy recovery device shall be a rotary heat exchanger per AHRI Standard 1060 description. The device will be an enthalpy wheel coated with a silica gel desiccant by a patented process without the use of binders or adhesives which may plug the desiccant aperture. The substrate shall be a lightweight polymer. Desiccant shall not dissolve or deliquesce in the presence of water or high humidity. The wheel shall be easily cleanable with standard coil cleaning solution. On UERV's Series 20 and less, the wheel will easily be removable from the cabinet for cleaning. On UERV's Series 20 and above, the wheel will be provided with removable segments for cleaning and maintenance. All diameter and perimeter seals shall be provided. The energy recovery cassette shall be Underwriters Laboratories Recognized Component for electrical and fire safety.

Balancing Dampers

Balancing dampers will be provided for all VR UERV’s. These dampers will be mounted inside the rooftop air conditioning unit to adjust for the amount of exhaust air on packaged units. On pivoting wheel models, the unit economizer becomes the balancing damper. Upflow and horizontal ERVs' will have the balancing damper provided in the ERV. Optional on VO and VS UERV’s when connected to rooftop units. (Except for VR074 and VR122.)

Barometric Relief Dampers

Barometric relief dampers will be provided in the exhaust air hood to prevent air infiltration when the UERV is de-energized.

ERV Support

All UERV's will be provided with support legs attached to the cabinet to support the intake and exhaust end of the ERV unit. Horizontal ERV's will be provided with support brackets for hanging.

Filters

All units shall be provided with mist eliminator type filters in the intake air hood.

Power Connection

The UERV shall be provided with a single point power connection for high voltage.

OPTIONS

Optional UERV Equipment Support

Furnish and install the optional equipment support for the intake and exhaust end of the unit.

Optional Roof Curb

Furnish and install the optional roof mounting frame to maintain proper height above the roof.

Optional Low Ambient Kit

Furnish and install the optional low ambient kit to prevent frost formation on the energy recovery wheel.

Optional Motorized Intake Air Damper

Furnish and install the optional motorized intake air damper.

Optional Stop-Start-Jog

On units without economizers furnish and install the optional stop-start-jog controls.

SEQUENCE OF OPERATION:

Fixed Models - Normal Operation

1. The space thermostat sends a signal to the RTU for cooling, heating or fan only operation.
2. The ERV is activated simultaneously with the supply blower of the RTU. The intake blower, the exhaust blower, and the wheel rotation motor of the ERV are activated. These motors will remain energized as long as the supply blower on the RTU is energized. The RTU is in standard (non-economizer) mode.
3. If the optional motorized fresh air damper in the outside air intake of the ERV is present, it opens and the ERV is energized.
4. If the optional low ambient kit is present, and the temperature leaving the exhaust side of the wheel drops below the field adjusted set point on the temperature sensor of the low ambient kit, the optional motorized fresh air damper will close and the intake blower will de-energize. The exhaust air blower and wheel rotation motor will continue to operate. When the temperature sensor has a sixteen-degree rise, the wheel is defrosted and the optional motorized damper will open and the fresh air blower will reactivate.

Pivoting Models - Normal Operation

1. The space thermostat sends a signal to the RTU for cooling, heating or fan only operation.
2. The ERV is activated with the supply blower of the RTU. The intake blower, the exhaust blower, and the wheel rotation motor of the ERV are activated. These motors will remain energized as long as the supply blower on the RTU is energized and the RTU is in standard (non-economizer) mode.
3. If the optional motorized fresh air damper in the outside air intake of the ERV is present, it opens and the ERV is energized.
4. If the optional low ambient kit is present, and the temperature leaving the exhaust side of the wheel drops below the field adjusted set point on the temperature sensor of the low ambient kit, the optional motorized fresh air damper will close and the intake blower will de-energize. The exhaust air blower and wheel rotation motor will continue to operate. When the temperature sensor has a sixteen-degree rise, the wheel is defrosted and the optional motorized damper will open and the fresh air blower will reactivate.

Pivoting Models - Economizer Operation

1. The space thermostat sends a signal to the RTU for cooling operation.
2. The outdoor air sensor for the RTU senses the outdoor air and determines it is appropriate for economizer operation.
3. As the economizer outside air dampers open, the ERV economizer end switch is activated sending a signal to the ERV that the system is in the economizer mode.
4. The intake blower, the exhaust blower and the wheel rotation motor all deactivate for up to two minutes. The optional motorized fresh air damper (if present) also closes.
5. The ERV enthalpy wheel pivots out of the air stream and the bypass dampers along each side of the intake blower open.
6. After a time delay to allow the wheel to pivot out of the airstream and the bypass dampers to open, the optional motorized fresh air damper opens to allow for full economizer operation, and the exhaust blower is reactivated to provide power exhaust for the system.

UERV TROUBLESHOOTING GUIDE

UERV BELOW 600 CFM WITH STATIONARY WHEEL (NO ECONOMIZER)

UERV will not operate.

1. Quick check items.
    a. Verify S51 door switch is closed. The switch must be in the closed position to power the A130 circuit board.
    b. Verify the A130 circuit board switch SW1 Power is in the “on” position.
    c. Verify 24 volts to A130 circuit board terminals TB1 “G” and “C” if in the cooling mode, or “W” and “C” if in the heating mode. The terminals must be powered to allow any blower relays / contactors to operate.
2. Verify high voltage power to UERV.
    a. Verify 110 volts for UERV to L1 and L2 on TB2 on the A130 board.
    b. Verify the F1 fuse is good. Replace any bad fuses.
    c. Verify that the T28 step down transformer on 208, 230, and 460 volt units have the voltage correctly applied to the correct transformer terminals.

UERV has power, but the enthalpy wheel does not spin.

1. Check wheel belt is in place and tight.
2. Verify the A130 circuit board switch SW1 Power is in the "on" position.
3. Verify the A130 circuit board terminals Wheel "1" and "2" are outputting 110 volts to B28 wheel motor through J/P150 plug assembly.
4. Verify B28 wheel motor C23 capacitor is good. Replace the capacitor if it is bad.
5. If the optional Stop, Start, Jog (SSJ) feature is installed, verify that the temperature setpoint on the SSJ does not have the wheel stopped.
6. If all of the above are operational, the wheel motor is bad. Replace it with new motor.

UERV has power, but the exhaust blower does not operate.

1. Verify the A130 circuit board switch SW1 Power is in the "on" position.
2. Verify the A130 circuit board terminals Exhaust "1” and "3” if in high speed operation, or "1” and "2" if in low speed operation are outputting 110 volts to B26 exhaust blower motor though J/P151 plug assembly.
3. Verify B26 wheel motor C25 capacitor is good. Replace the capacitor if it is bad.
4. If all of the above are operational, the exhaust motor is bad. Replace it with new motor.

UERV has power, but the fresh air blower does not operate.

1. Verify the A130 circuit board switch SW1 Power is in the "on" position.
2. Verify the A130 circuit board terminals Fresh "1” and "3" if in high speed operation, or "1” and "2" if in low speed operation are outputting 110 volts to B27 fresh air blower motor though J/P148 plug assembly.
3. On units equipped with the optional low ambient control, verify that the A130 circuit board TB3 terminals marked "low ambient" are closed. The low ambient control will stop the fresh air motor operation and close the optional outside air damper if it senses conditions for frost on the UERV wheel. The "low ambient" terminals can be jumped together to verify if the low ambient control has the fresh air blower stopped.
4. Verify B27 wheel motor C26 capacitor is good. Replace the capacitor if it is bad.
5. If all of the above are operational, the fresh air motor is bad. Replace it with new motor.

UERV has power, but the optional motorized fresh air damper does not open.

1. Verify 24 volts to A130 circuit board terminals TB1 "G" and "C" if in the cooling mode, or "W" and "C" if in the heating mode.
2. Verify the A130 circuit board switch SW1 Power is in the "on" position.
3. Verify 24 volts to B30 motorized outdoor air motor through J/P160 plug assembly.
4. If all of the above are operational, replace the outdoor air damper motor.

UERV ABOVE 600 CFM WITH STATIONARY WHEEL (NO ECONOMIZER)

UERV will not operate.

1. Quick check items.
    a. Verify S51 door switch is closed. The switch must be in the closed position to power the A130 circuit board.
    b. Verify 24 volts to A130 circuit board terminals XFORMER "+" and "-". The terminals must be powered to allow blower contactors to operate.
    c. Verify 24 volts to A130 circuit board terminals TB 37 numbers "1" and "3". Terminal "1" is the hot and "3" is the common side of the power source from activation power source (a/c unit, energy management

control, etc.). Typically, "1" would be from the blower contactor on an a/c unit.

2. Verify high voltage power to UERV.
   a. Check for correct voltage for UERV to L1 and L2 on 1-phase units.
   b. Check for correct voltage for UERV to L1, L2, and L3 on 3-phase units.
   c. Verify the F29 fuses are good. Replace any bad fuses.
   d. Verify that the T27 transformer has the UERV voltage correctly applied to the correct transformer terminals.

UERV has power, but the enthalpy wheel does not spin.

1. Check wheel belt is in place and tight.
2. Verify the A130 circuit board terminals Exhaust "A" (hot) and "B" (common) are outputting 24 volts to K163 contactor terminal "A" and "B" and that the contacts are closed.
3. Verify power to B28 wheel motor.
4. Verify B28 wheel motor C23 capacitor is good. Replace the capacitor if it is bad. (Except VR074 to VR122)
5. If the optional Stop, Start, Jog (SSJ) feature is installed, verify that the timer on the SSJ does not have the wheel stopped.
6. If all of the above are operational, the wheel motor is bad. Replace it with new motor.

UERV has power, but the exhaust blower does not operate.

1. Check that the blower belt is in place and tight on belt drive models. If it is loose, tighten it. If it is broken replace it.
2. Verify the A130 circuit board terminals Exhaust "A" (hot) and "B" (common) are outputting 24 volts to K163 contactor terminal "A" and "B", and that the contacts are closed.
3. Verify power to B26 exhaust blower motor.
4. On direct drive models, verify B26 wheel motor C25 capacitor is good. Replace if necessary.
5. If all of the above are operational, the exhaust motor is bad. Replace it with new motor.

UERV has power, but the fresh air blower does not operate.

1. Check that the blower belt is in place and tight on belt drive models. Tighten it if it is loose. Replace it if it is broken.
2. Verify the A130 circuit board terminals Fresh "A" (hot) and "B" (common) are outputting 24 volts to K164 contactor terminal "A" and "B", and that the contacts are closed.
3. Verify power to B27 fresh air blower motor though J/P148 plug assembly.
4. On direct drive models, verify B27 wheel motor C26 capacitor is good. Replace if necessary.
5. On units equipped with the optional low ambient control, verify that the circuit on the A130 circuit board terminal "5" and "6" is closed. The low ambient control will stop the fresh air motor operation and close the optional outside air damper if it senses frost on the UERV wheel. Terminal "5" and "6" can be jumped together to verify if the low ambient control has the fresh air blower stopped.
6. If all of the above are operational, the fresh air motor is bad. Replace it with new motor.

UERV has power, but the optional motorized fresh air damper does not open.

1. Verify 24 volts to the A130 circuit board terminals XFORMER "+" and "-".
2. Verify 24 volts to A130 circuit board terminals TB 37 numbers "1" and "3". Terminal "1" is the hot and "3" is the common side of the power source from activation power source (a/c unit, energy management control, etc.). Typically, "1" would be from the blower contactor on an a/c unit.
3. Verify 24 volts to B30 motorized outdoor air motor through J/P160 plug assembly.
4. If all of the above are operational, replace the outdoor air damper motor.

UERV ABOVE 600 CFM WITH PIVOTING WHEEL (USED WITH ECONOMIZER)

UERV will not operate.

1. Quick check items.
   a. Verify S51 door switch is closed. The switch must be in the closed position to power the A130 circuit board.
   b. Verify 24 volts to A130 circuit board terminals XFORMER "+" and "-". The terminals must be powered to allow any blower relays / contactors to operate.
   c. Verify 24 volts to A130 circuit board terminals TB 37 numbers "1" and "3". Terminal "1" is the hot and "3" is the common side of the power source from activation power source (a/c unit, energy management control, etc.). Typically, "1" would be from the blower contactor on an a/c unit.
2. Verify high voltage power to UERV.
   a. Check correct voltage for UERV to L1 and, L2 on 1-phase units.

b. Check for correct voltage to L1, L2, and L3 on 3-phase units.

c. Verify the F29 fuses are good. Replace any bad fuses.

d. Verify that the T27 transformer has the UERV voltage correctly applied to the correct transformer terminals.

UERV has power, but the enthalpy wheel does not spin.

1. Check wheel belt is in place and tight.
2. Verify the A130 circuit board terminals Exhaust 1 "A" (hot) and "B" (common) are outputting 24 volts to K163 contactor terminal "A" and "B" and that the contacts are closed.
3. Verify power to B28 wheel motor through J/P150 plug assembly.
   a. If there is no power on the T1 leg of the motor (pivoting models only) verify that the S110 switch located inside the B29 damper motor is in the closed position.
4. Verify B28 wheel motor C23 capacitor is good. Replace the capacitor if it is bad.
5. If all of the above are operational, the wheel motor is bad. Replace it with new motor.

UERV has power, but the exhaust blower does not operate.

1. Check that the blower belt is in place and tight. If it is loose, tighten it. If it is broken replace it.
2. Verify the A130 circuit board terminals Exhaust 1 "A" (hot) and "B" (common) are outputting 24 volts to K163 contactor terminal "A" and "B", and that the contacts are closed.
3. Verify power to B26 exhaust blower motor though J/P151 plug assembly.
4. On direct drive models, verify B26 wheel motor C25 capacitor is good. Replace if necessary.
5. If all of the above are operational, the exhaust motor is bad. Replace it with new motor.

UERV has power, but the fresh air blower does not operate.

1. Energy Recovery Mode of operation.
   a. Check that the blower belt is in place and tight on belt drive models. Tighten it if it is loose. Replace it if it is broken.
   b. Verify the A130 circuit board terminals Fresh "A" (hot) and "B" (common) are outputting 24 volts to K164 contactor terminal "A" and "B", and that the contacts are closed.
   c. Verify power to B27 fresh air blower motor though J/P148 plug assembly.
   d. On units equipped with the optional low ambient control, verify that the circuit on the A130 circuit board terminal "5" and "6" is made. The low ambient control will stop the fresh air motor operation and close the optional outside air damper if it senses frost on the UERV wheel. Terminal "5" and "6" can be jumped together to verify if the low ambient control has the fresh air blower stopped.
   e. On direct drive models, verify B27 wheel motor C26 capacitor is good. Replace if necessary.
   f. If all of the above are operational, the fresh air motor is bad. Replace it with new motor.
2. Economizer Mode of operation.
   a. The fresh air blower is not operational in the economizer mode.

UERV has power, but the wheel does not rotate out of airstream during economizer operation.

1. Check the linkage from the B29 damper motor to the UERV wheel.
2. Verify shipping retainers are removed.
3. Verify the S122 economizer end switch is closed. The switch is located on the damper and closes when the damper moves from minimum position to the economizer position (field adjustable).
4. Verify the B29 damper motor has 24 volts to terminals "B" and "T1" through J/P160 plug assembly
5. If all of the above are operational, replace the damper motor.

UERV has power, but the optional motorized fresh air damper does not open.

1. Verify 24 volts to the A130 circuit board terminals XFORMER "+" and "-".
2. Verify 24 volts to A130 circuit board terminals TB 37 numbers "1" and "3". Terminal "1" is the "hot" and "3" is the "common" side of the power source from activation power source (a/c unit, energy management control, etc.). Typically, "1" would be from the blower contactor on an a/c unit.
3. Verify 24 volts to B30 motorized outdoor air motor through J/P160 plug assembly.
4. If all of the above are operational, replace the outdoor air damper motor.

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