RRS ROOFTOP SYSTEMS

Engineering Data

Unitized Energy Recovery Ventilators for use with Daikin Air Conditioning

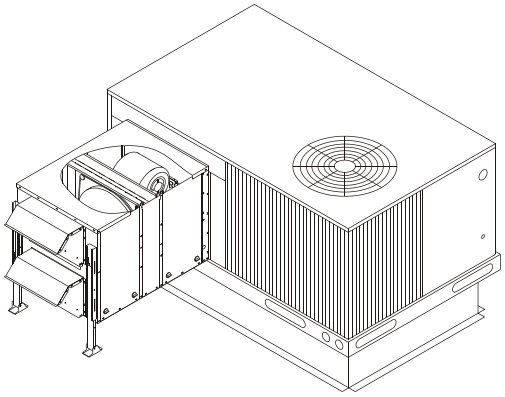
February 22, 2016
Supersedes 12-12-13

Energy recovery COMPONENT certified to the AHRI Air-to-Air Energy Recovery Ventilation Equipment Certification Program in accordance with AHRI Standard 1060-2000. Actual performance in packaged equipment may vary.

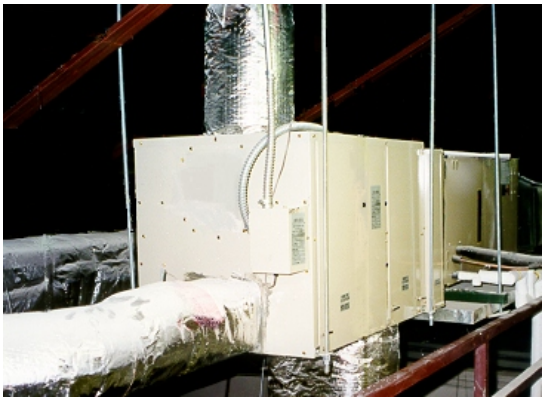
- Reduces cooling load at design temperatures up to 4 tons per 1000 cfm of outside air.
- Reduces heating load up to 12,000 Btuh per 400 cfm of outside air.
- Dry energy transfer. Moisture in supply (intake) air stream is transferred to exhaust air stream in a vapor state, eliminating condensate plumbing in the ventilator.
- Attaches directly to the rooftop units, upflow air handlers or horizontal air handlers. All mounting equipment is provided.
- Separate point power connection.
- Filters / mist eliminators are provided on the entering air openings of the outdoor units.
- Adjustable support legs are provided on rooftop models.
- Two modes of operation (Pivoting Wheel Rooftop Models).
  - Recovery mode during normal energy recovery operation.
  - True Economizer mode when outside sensor calls for economizer operation (packaged units equipped with economizers). **U S Patent # 5,548,970**.
- Pivoting wheel models used with packaged unit with Rooftop Systems economizer. Sequence of operation controlled by economizer.
- Balancing dampers provided on "R" Model Stationary Wheel Modules.
- Centrifugal blowers (both intake and exhaust) for high static capability and low sound levels.
- Heavy gauge galvanized steel cabinets corrosion protected with powder paint process.
- Fully insulated cabinet.
- **AHRI rated 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.
- Continuous operation down to 10°F (-12°C) without defrost at indoor relative humidity up to 40%. For temperatures below 10°F (-12°C), Optional Low Ambient Control Kit is required. Kit includes temperature sensor to shutoff power to UERV before frost build up can occur on recovery wheel.
- Staged power exhaust (larger models).

ETL Certified per UL 1995 and CSA 22.2

Typical Applications



UERV Unit with a 2-5 Ton Package Unit



UERV Unit with Horizontal Air Handler
(Return Air to Bottom of UERV, Outside Air and Exhaust Ducted to Outside)

UERV Unit with Upflow Air Handler
(Return Air Ducted, Outside Air and Exhaust Ducted to Outside)

Applications

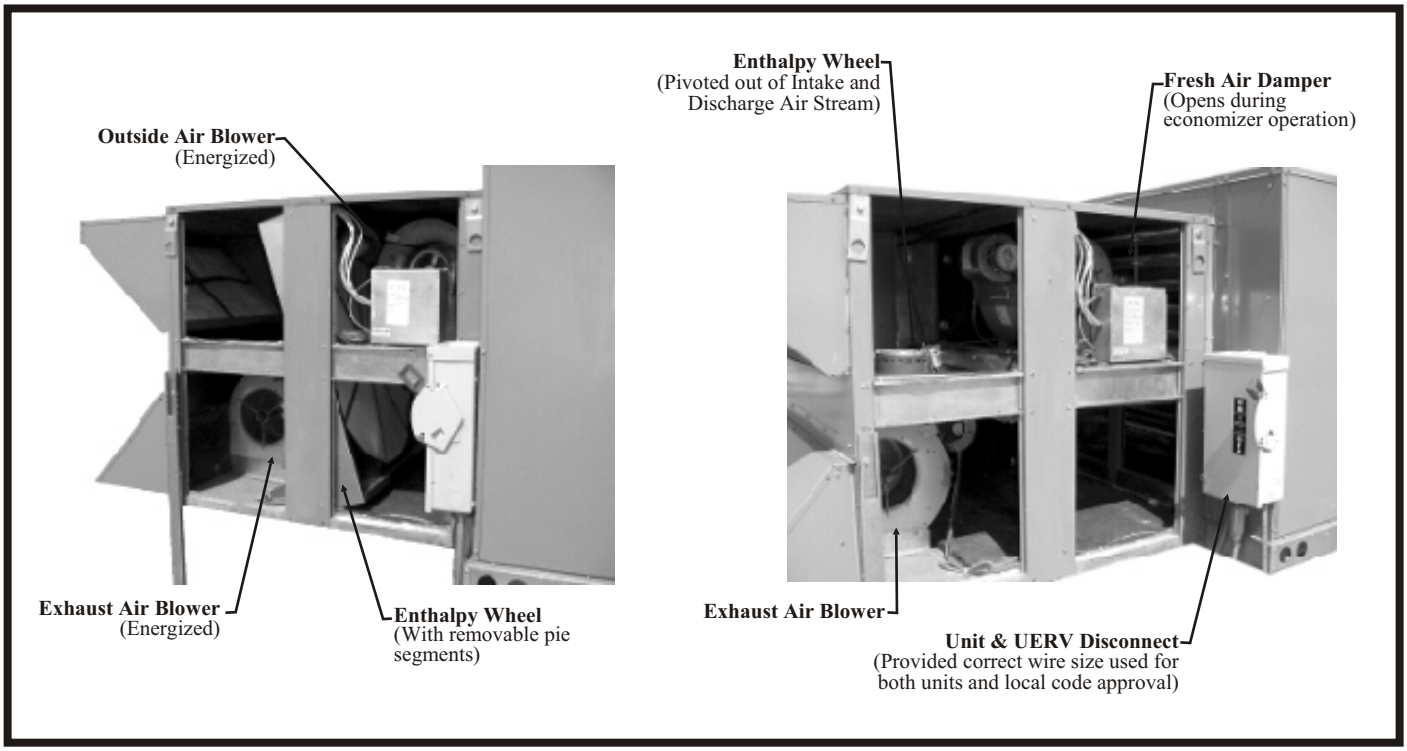
Unitized Energy Recovery Ventilators (UERV) are used with the rooftop packaged units, upflow air handlers, and horizontal air handlers. The recovery wheel provides sensible and latent energy exchange between the entering and exhaust air streams of a building. This allows a substantial amount of the energy 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 with high occupancy loads or high ventilation requirements. Areas that have high humidity or very low humidity (recover exhaust humidity air from buildings that have humidifiers) are good applications. UERV's also reduce the design loads due to outside air, which can mean downsizing the air conditioning equipment. Application software is available to calculate the load reductions and 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 captures 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 rooftop units equipped with an economizer, 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.

True Economizer Operation

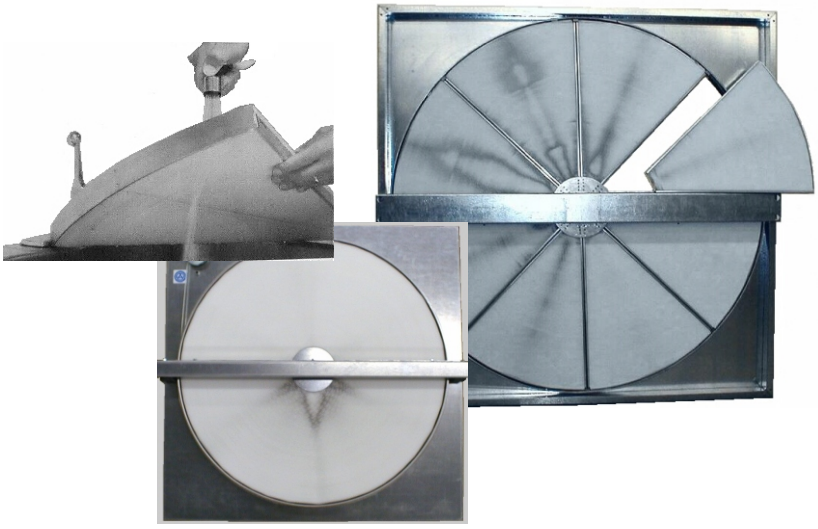
The UERV provides true economizer operation. By pivoting the wheel of the UERV out of the air stream, the air conditioning system can utilize 100% of the air conditioning units blower capabilities (**U S Patent # 5,548,970**). Most manufacturers have an "economizer mode" operation on their UERV systems. The competitors "economizer mode" simply stops or jogs the wheel so that it does not recover any energy. By stopping or jogging the wheel, they can only introduce fresh air up to the rated airflow of the UERV (normally less than 50%). They must also have both intake and exhaust blowers energized. Not all packaged units can have the pivoting wheel design due to air conditioning unit arrangement.



Enthalpy Wheels and AHRI

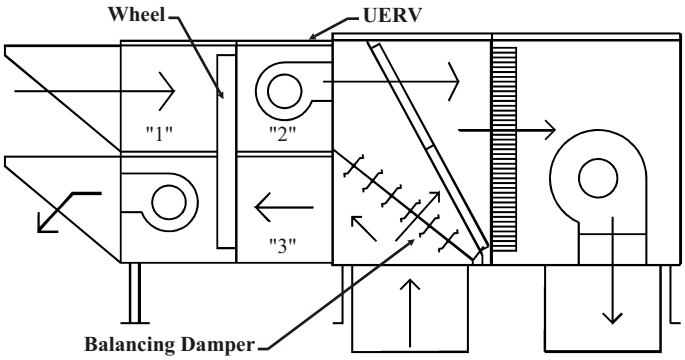
Energy Recovery Wheel

The heart of the Unitary 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 (19 inch diameter) are slide out cassettes, and the larger wheels have pie segments that are removable for



AHRI Standard 1060-2000 for Air-to-Air Energy Recovery Ventilation Equipment

The Air-Conditioning and Refrigeration Institute (AHRI) issued Standard 1060-2000 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 Unitary Energy Recovery Ventilator (UERV). All of the RRS UERV's have an AHRI certified energy recovery wheel. The data shown in the specification charts are the AHRI certified data for the wheel. Actual performance in the UERV may vary.



Critical Terms for Standard 1060 are as follows:

1. Effectiveness. The measured energy recovery effectiveness not adjusted to account for that portion of the psychometric 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).

Optional Accessories

UERV Equipment Support – 8 inch (203 mm) high base for support of the exhaust and intake end of the UERV.

UERV "-CFM"	Part No.
- 550	01-210-3608
- 1,000	01-210-4808
- 1,700	01-210-4808
- 2,800	01-210-4808
- 3,600	01-210-6008
- 4,600	01-210-6008

Roof Mounting Frame – A 14 or 24 inch (356 or 610 mm) roof curb is required to match supply and exhaust openings of the UERV with the rooftop units. RRS provides a full line of roof curbs to match the specified unit.

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.

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

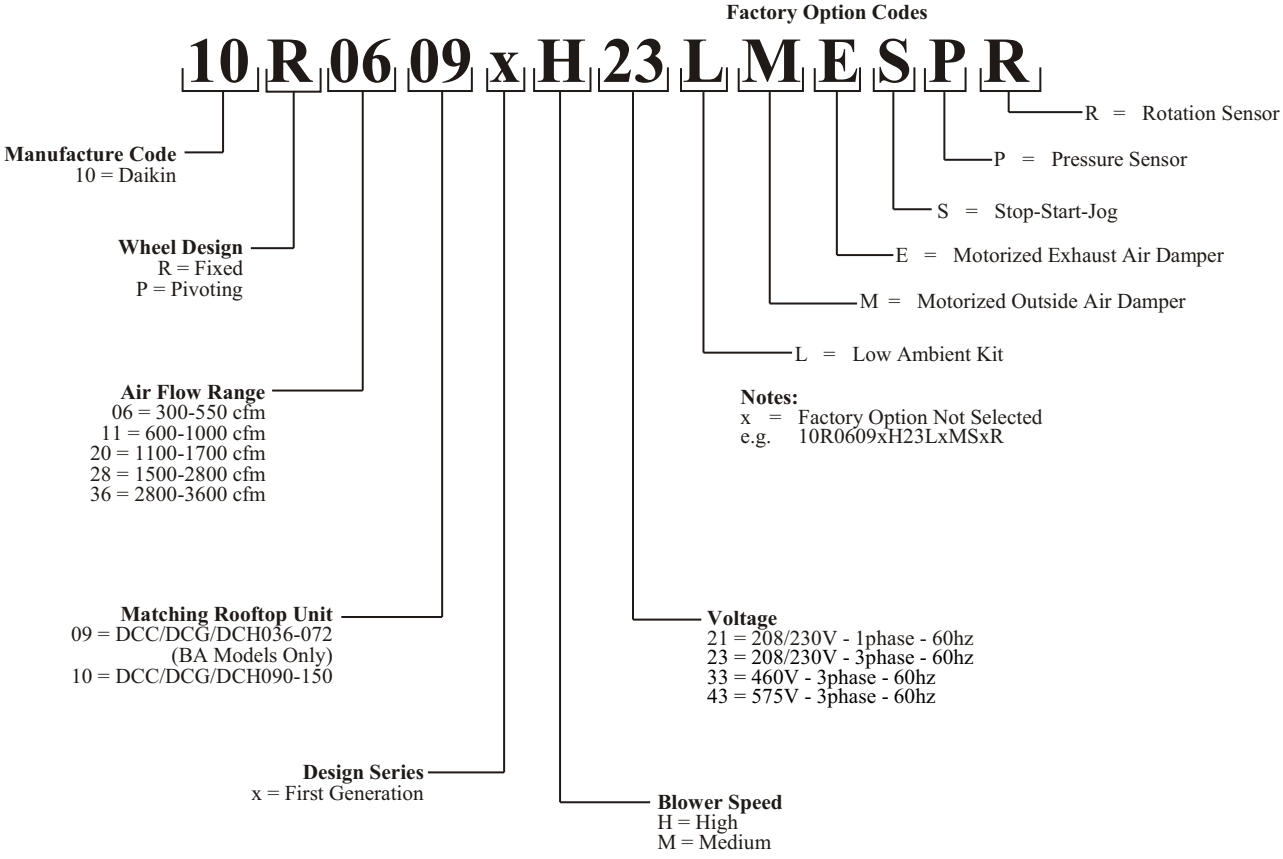
Motorized Exhaust Air Damper – Damper mounts in the barometric relief hood. Damper opens when the ERS is energized and closes when de-energized.

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.

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

Rotation Sensor – Verifies the rotation of the enthalpy wheel.

MODEL NUMBER IDENTIFICATION



UERV Outside Air CFM Selection Table by CFM								
Unit - Tons	300-550	600-1000	1100-1700	1500-2800	2800-3600	3400-4600	4800-5400	5400-6200
Rooftop	3 - 6	3- 6	3 - 6					
			7.5 – 12.5	7.5 – 12.5	7.5 – 12.5	7.5 – 12.5		
Upflow	2 - 5	2 - 5						
Horizontal	2 - 5	2 - 5	**Stand Alone UERV's are available for equipment room applications.**					

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 of 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 that that required for a purge sector. Do not use the RRS UERV's in applications that have concentrations of contaminants.

Performance - 3 through 12 ½ ton units

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

"R" Series Stationary Wheel for Units without Economizers

Goodman Packaged Unit Model No.	Unit Size (Tons)	UERV CFM Range	RRS UERV Model No.	Elect.	Voltage - Phase	Nominal AHRI Data (Total)		
						CFM	Net Effectiveness	
							Heating	Cooling
DCC 036-072 DCH 036-072 DCG 036-072	2 - 6	300-550	10-R06-09xH	-01	110v - 1ph	500	65%	64%
				-21	208/230v - 1ph			
				-23	208/230v - 3ph			
				-33	460v - 3ph			
		600-1000	10-R11-09xH	-23	208/230v - 3ph	900	73%	72%
				-33	460v - 3ph			
				-43	575v-3ph			
		1100-1700	10-R20-09xH	-23	208/230v - 3ph	1600	65%	64%
				-33	460v - 3ph			
				-43	575v - 3ph			
DCC 090-150 DCH 090-150 DCG 090-150	7.5 - 12.5	1100-1700	10-R20-10xH	-23	208/230v - 3ph	1600	65%	64%
				-33	460v - 3ph			
				-43	575v - 3ph			
		1500-2200	10-R28-10xM	-23	208/230v - 3ph	1950	71%	70%
				-33	460v - 3ph			
				-43	575v - 3ph			
		2200-2800	10-R28-10xH	-23	208/230v - 3ph	2600	65%	63%
				-33	460v - 3ph			
				-43	575v - 3ph			
		2800-3600	10-R36-10xH	-23	208/230v - 3ph	3100	65%	63%
				-33	460v - 3ph			
				-43	575v - 3ph			

Note:
1. Complete RRS UERV model number includes the electrical information. Example: DCC 036 needing 500 CFM outside of air at 230 volts - 3 phase. Model would be a 10-R06-09xH-23.

Performance - 3 through 12 ½ ton units

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

"P" Series Pivoting Wheel for Units with Economizers

Goodman Packaged Unit Model No.	Unit Size (Tons)	UERV CFM Range	Power Exhaust	RRS UERV Model No.	Elect.	Voltage - Phase	Nominal AHRI Data (Total)		
							CFM	Net Effectiveness	
								Heating	Cooling
DCC 036-072 DCH 036-072 DCG 036-072	3.5 - 5	600-1000	1900	10-P11-09xH	-23	208/230v - 3ph	900	73%	72%
					-33	460v - 3ph			
					-43	575v - 3ph			
		1100-1700	3000	10-P20-09xH	-23	208/230v - 3ph	1600	65%	64%
					-33	460v - 3ph			
					-43	575v - 3ph			
DCC 090-150 DCH 090-150 DCG 090-150	7.5 - 12.5	1100-1700	3000	10-P20-10xH	-23	208/230v - 3ph	1600	65%	64%
					-33	460v - 3ph			
					-43	575v - 3ph			
		1500-2200	3450	10-P28-10xM	-23	208/230v - 3ph	1950	71%	70%
					-33	460v - 3ph			
					-43	575v - 3ph			
		2200-2800	4200	10-P28-10xH	-23	208/230v - 3ph	2600	65%	63%
					-33	460v - 3ph			
					-43	575v - 3ph			
		2800-3600	4650	10-P36-10xH	-23	208/230v - 3ph	3100	65%	63%
					-33	460v - 3ph			
					-43	575v - 3ph			

Note:
1. Complete RRS UERV model number includes the electrical information. Example: DCC 036 needing 800 CFM outside of air at 230 volts - 3 phase. Model would be a 10-P11-09xH-23.

Specifications and Electrical Data - 300 through 550 CFM UERV's				
UERV Series		**R06 - Rooftop Stationary H06 - Horizontal Split System U06 - Upflow Split System**		
Line Voltage - 60hz		115v - 1ph	208*/230*/460*v - 1ph	208*/230*/460*v - 3ph
Fresh Air Blower	Motor - hp	0.2 / 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	3.8		
	Service Factor	1.1		
Wheel Electrical Data	Potential Volts	115		
	Motor Speed -rpm	1050		
	Full Load Amps	0.6		
Total Electrical	MCA	8.7		
	OCPD	10.0		
Wheel Data	Wheel Depth	2		
	Wheel Diameter -in	19.3		
	Construction	One Piece / Polymeric		
Curb	A/C Unit Curb Height - in	14		
Weights	Shipping Weight - lbs. (kg)	198		
	Net Weight - lbs. (kg)	155		

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

AHRI Certified Ratings				
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%
Enthalpy Wheel Airflow Data				
Nominal Airflow CFM		500 @ .6D		
EATR - -0.50 HO		9.90%		
EATR - 0.00 HO		0.20%		
EATR - +0.50 HO		0.00%		
OACF - -0.50 HO		1.02		
OACF - 0.00 HO		1.33		
OACF - +0.50 HO		1.59		

Specifications and Electrical Data - 600 through 1000 CFM UERV's					
UERV Series		**R11 - Rooftop Stationary P11 - Rooftop Pivoting H11 - Horizontal U11 - Upflow**			
Line Voltage - 60hz		208/230v - 1ph	208/230v - 3ph	460v - 1ph	460/*575v - 3ph
Fresh Air Blower	Motor - hp	0.5 / PSC			
	Wheel Size (dia x width) -in	10 x 6 AT			
	Motor Speed -rpm	1120 / 960 / 850			
	Motor Speed(s)	3			
	Bearing Type	Sleeve			
	Full Load Amps	3.4			
	Service Factor	1.0			
Exhaust Air Blower	Motor - hp Stationary	0.5 / PSC			
	Motor - hp Pivoting	0.5 / PSC			
	Wheel Size (dia x width) -in	10 x 6 AT			
	Motor Speed -rpm	1120 / 960 / 850			
	Motor Speed(s)	3			
	Bearing Type	Sleeve			
	Full Load Amps-Stationary	3.4		1.5	
	Full Load Amps-Pivoting	3.4		1.5	
	Service Factor	1.0			
Wheel Electrical Data	Potential Volts	208 / 230			
	Motor Speed -rpm	1050			
	Full Load Amps	0.6			
Total Electrical	MCA - Stationary	8.25		4.4	
	OCPD - Stationary	10.0		6.0	
	MCA - Pivoting	8.25		4.4	
	OCPD - Pivoting	10.0		6.0	
Wheel Data	Wheel Depth - in	3			
	Wheel Diameter - in	25.3			
	Construction / Media	One Piece / Polymeric			
Curb	A/C Unit Curb Hgt - in	14 or 24			
Weights	Shipping Weight - lbs. (kg)	318			
	Net Weight - lbs. (kg)	245			

*** Note: A stepdown transformer is provided to stepdown 575v primary to 460v secondary.**

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 Airflow Data				
Nominal Airflow CFM		900 @ 1.0D		
EATR - -1.00 HO		9.30%		
EATR - 0.00 HO		0.70%		
EATR - +1.00 HO		0.00%		
OACF - -1.00 HO		0.97		
OACF - 0.00 HO		1.19		
OACF - +1.00 HO		1.34		

Specifications and Electrical Data - 1100 through 1700 CFM UERV's				
UERV Series		**R20 - Rooftop Stationary P20 - Rooftop Pivoting**		
Line Voltage - 60hz		208/230v - 3ph	460v - 3ph	575v - 3ph
Fresh Air Blower	Motor - hp	1 / Belt		
	Wheel Size (dia x width) -in	9 x 9		
	Motor Speed -rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps	3.8	1.9	1.4
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	1 / Belt		
	Motor - hp Pivoting	1.5 / Belt		
	Wheel Size (dia x width) -in	9 x 9		
	Motor Speed -rpm	1725		
	Motor Speed(s)	Adjustable Sheave		
	Bearing Type	Ball		
	Full Load Amps-Stationary	3.8	1.9	1.4
	Full Load Amps-Pivoting	5.6	2.8	2.0
	Service Factor	1.15		
Wheel Electrical Data	Potential Volts	208 / 230		
	Motor Speed -rpm	1050		
	Full Load Amps	0.6		
Total Electrical	MCA - Stationary	9.15	4.9	3.8
	OCPD - Stationary	12.0	6.0	5.0
	MCA - Pivoting	11.4	6.0	4.5
	OCPD - Pivoting	15.0	8.0	6.0
Wheel Data	Wheel Depth - in	3		
	Wheel Diameter - in	30.346		
	Construction / Media	One Piece / Polymeric		
Curb	A/C Unit Curb Hgt - in	14 or 24		
Weights	Shipping Weight - lbs. (kg)	425		
	Net Weight - lbs. (kg)	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 Airflow Data				
Nominal Airflow CFM		1600 @ .95D		
EATR - -1.00 HO		7.80%		
EATR - 0.00 HO		0.40%		
EATR - +1.00 HO		0.00%		
OACF - -1.00 HO		0.97		
OACF - 0.00 HO		1.16		
OACF - +1.00 HO		1.29		

Specifications and Electrical Data - 1500 through 2800 CFM UERV's				
UERV Series		**R28 - Rooftop Stationary P28 - 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	2.0
	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	2.0
	Full Load Amps-Pivoting	9.0	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	1725		
	Full Load Amps	1.1		
Total Electrical	MCA - Stationary	13.7	7.4	5.6
	OCPD - Stationary	20.0	10.0	7.0
	MCA - Pivoting	18.0	9.4	7.6
	OCPD - Pivoting	25.0	12.0	10.0
Wheel Data	Wheel Depth x Diameter - in	3 x 37.759		
	Construction / Media Type	Segmented Pies/Polymeric		
Curb	A/C Unit Curb Height - in	14 or 24		
Weights	Shipping Weight - lbs. (kg)	470		
	Net Weight - lbs. (kg)	395		

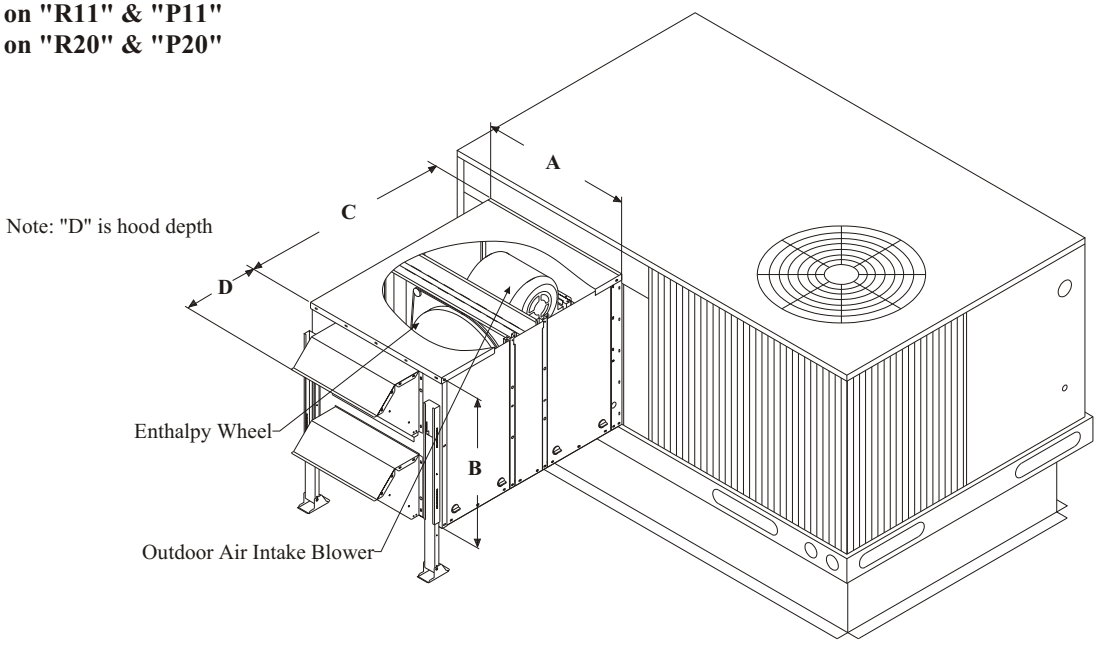
AHRI Certified Ratings				
Thermal Ratings @ 0" Pressure Diff.		**Sensible**	**Latent**	**Total**
Total Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Net Effectiveness	100% Airflow Heating	68%	60%	65%
	75% Airflow Heating	74%	67%	71%
	100% Airflow Cooling	68%	60%	63%
	75% Airflow Cooling	74%	67%	70%
Enthalpy Wheel Airflow Data				
Nominal Airflow CFM		2600 @ .95D		
EATR - -1.00 HO		6.10%		
EATR - 0.00 HO		0.40%		
EATR - +1.00 HO		0.00%		
OACF - -1.00 HO		0.99		
OACF - 0.00 HO		1.13		
OACF - +1.00 HO		1.23		

Specifications and Electrical Data - 2800 through 3600 CFM UERV's				
UERV Series		**R36 - Rooftop Stationary P36 - Rooftop Pivoting**		
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	6.6	3.3	2.4
	Service Factor	1.15		
Exhaust Air Blower	Motor - hp Stationary	2 / Belt		
	Motor - hp Pivoting	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	6.6	3.3	2.4
	Full Load Amps-Pivoting	9.4	4.3	3.2
	Service Factor	1.15		
Wheel Electrical Data	Motor - hp (1 phase)	0.5		
	Potential Volts	200-208 / 230		
	Motor Speed -rpm	1725		
	Full Load Amps	1.2		
Total Electrical	MCA - Stationary	16.1	8.6	6.6
	OCPD - Stationary	20.0	12.0	9.0
	MCA - Pivoting	19.6	9.9	7.6
	OCPD - Pivoting	25.0	15.0	10.0
Wheel Data	Wheel Depth x Diameter - in	3 x 41.825		
	Construction / Media Type	Segmented Pies/Polymeric		
Curb	A/C Unit Curb Height - in	14 or 24		
Weights	Shipping Weight - lbs. (kg)	571		
	Net Weight - lbs. (kg)	475		

ARI 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 Airflow Data				
Nominal Airflow CFM		3100 @ .9D		
EATR - -1.00 HO		4.90%		
EATR - 0.00 HO		1.30%		
EATR - +1.00 HO		0.30%		
OACF - -1.00 HO		0.99		
OACF - 0.00 HO		1.07		
OACF - +1.00 HO		1.12		

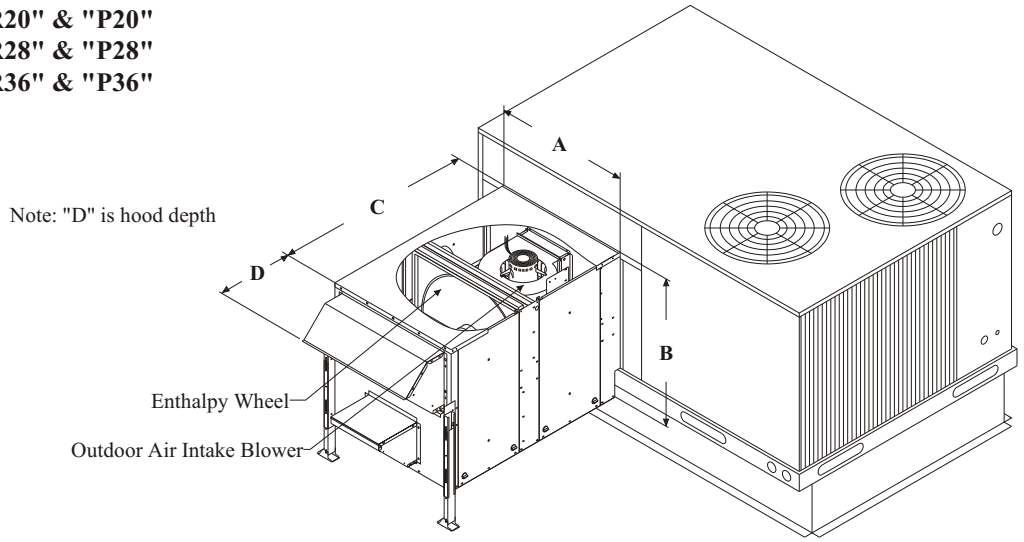
UERV Dimensional Data - 3 - 12 ½ Ton - inches (mm)

14" High Curbs Required on "R06"
24" High Curbs Required on "R11" & "P11"
24" High Curbs Required on "R20" & "P20"



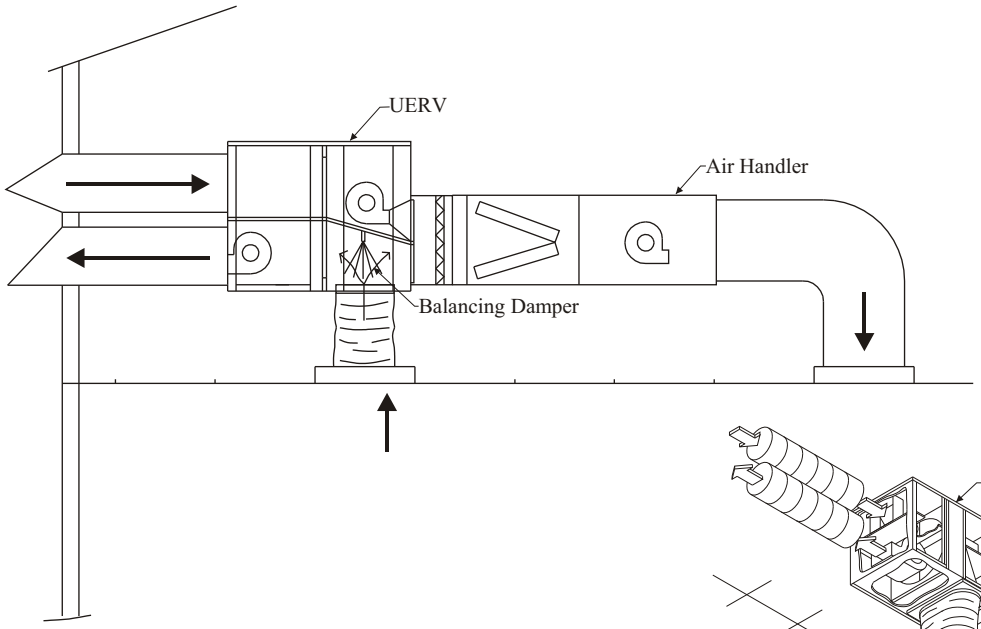
UERV Model	Cabinets Used With	A	B	C	D	CFM
10-R06-09	DCC 036-072 DCH 036-072 DCG 036-072	24.75 (629)	24.63 (626)	34.56 (878)	8.00 (203)	300-550
10-R11-09 10-P11-09		32.13 (816)	33.50 (851)	44.75 (1137)	11.00 (279)	600-1000
10-R20-09 10-P20-09		37.25 (946)	37.50 (953)	54.38 (1381)	20.32 (516)	1100-1700

24" High Curbs Required on "R20" & "P20"
24" High Curbs Required on "R28" & "P28"
24" High Curbs Required on "R36" & "P36"



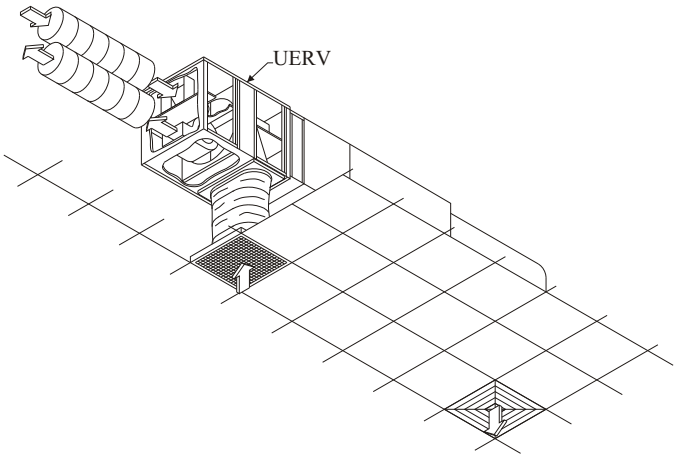
UERV Model	Cabinets Used With	A	B	C	D	CFM
10-R20-10 10-P20-10	DCC 090-150 DCH 090-150 DCG 090-150	37.25 (946)	37.50 (953)	54.38 (1381)	20.32 (516)	1100-1700
10-R28-10 10-P28-10		42.63 (1083)	43.56 (1106)	52.25 (1327)	18.32 (465)	1500-2800
10-R36-10 10-P36-10		46.68 (1186)	57.38 (1457)	60.00 (1524)	18.32 (465)	2800-3600

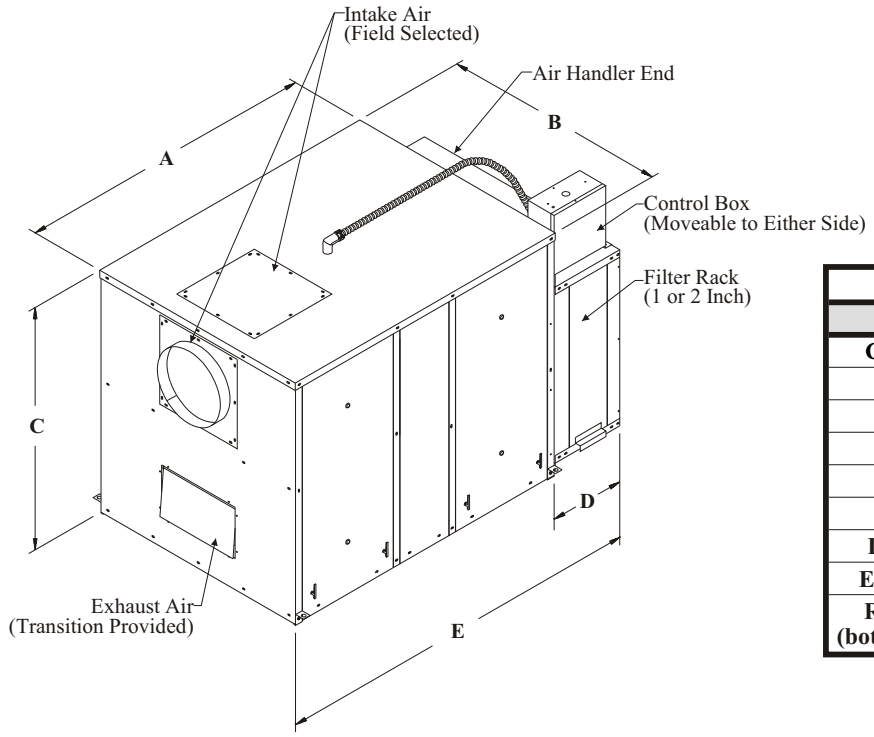
Horizontal Split System UERV's (inches)



H06 & U06 Transformer Kit	
Model No.	**Voltage - Phase**
01-TRN-201	208v - 1ph
01-TRN-203	208v - 3ph
01-TRN-231	230v - 1ph
01-TRN-233	230v - 3ph
01-TRN-461	460v - 1ph
01-TRN-463	460v - 3ph

Note:
Transformer kits are field installed.





Dimensions		
Model No.	**H06**	**H11**
CFM Range	300-550	600-1000
A	34.13	40.25
B	24.38	30.25
C	24.62	32.50
D	5.63	10.00
E	39.75	50.25
Intake Duct	9 rd	10 rd
Exhaust Duct	9 rd	10 rd
Return Duct (bottom of UERV)	16 or 18 oval	16 or 18 oval

Features

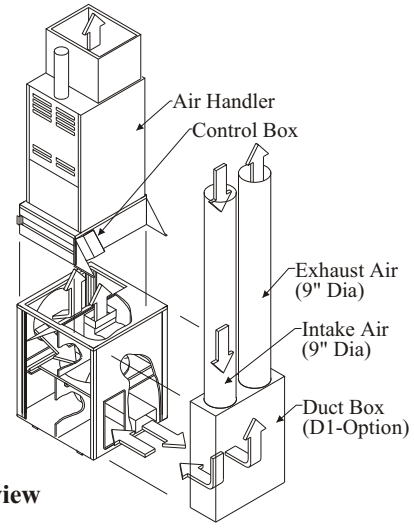
1. Fresh air intake can be field located on top or end of unit.
2. Electrical control box can be located to either side for access.
3. Access panels located on both sides of UERV for servicing.
4. Static test ports are provided for verification of CFM.
5. Filter rack accepts 1" or 2" filters and comes with flex connector to air handler.

Note: Applications with extensive duct on intake and exhaust may require booster fans.
Field Transitioning Required.

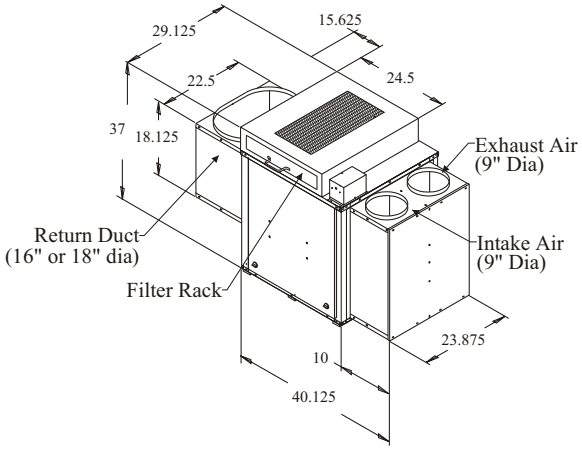
Upflow Split System UERV's (inches)

01U0601xD Series for 300 - 450 CFM UERV for Ducted Applications

Features include service access from either end with control box moveable to either side. **Note: Applications with extensive duct on intake and exhaust may require booster fans. Field Transitioning Required.**

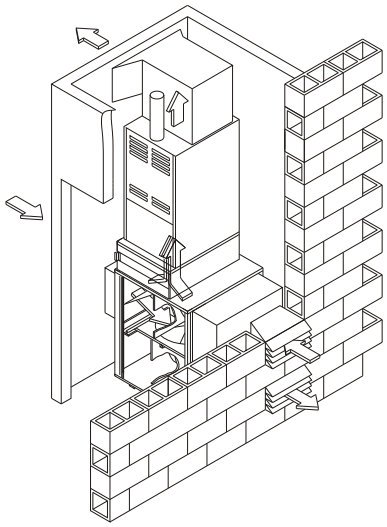


Exploded view

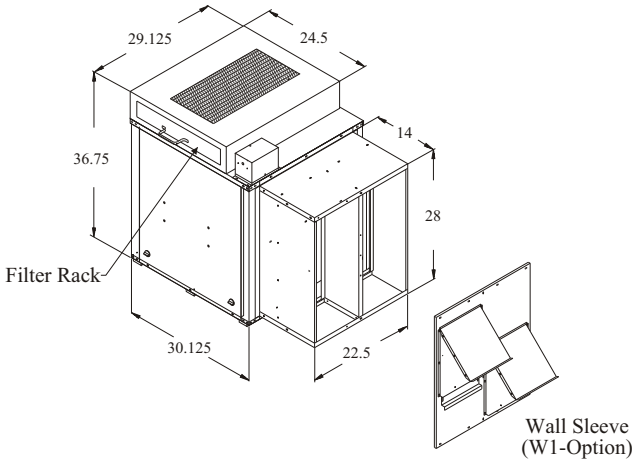


01U0601xW Series for 300 - 450 CFM UERV for Thru-the-Wall Applications

Features include service access from either end with control box moveable to either side. **Field Transitioning Required.**

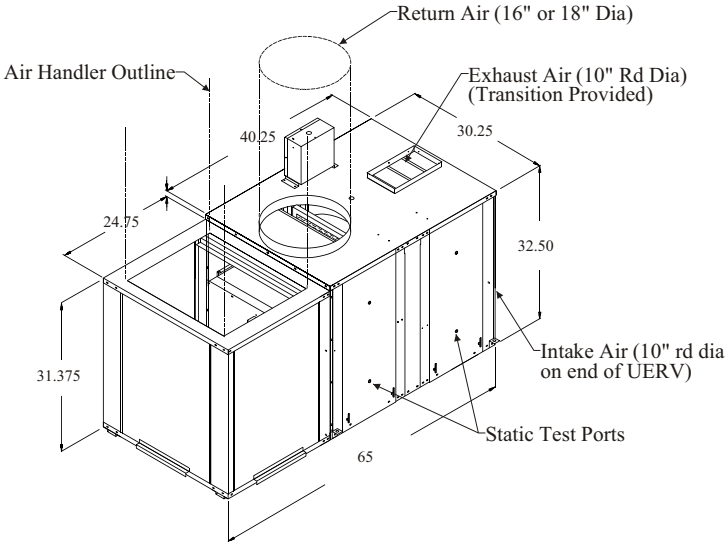


Perfect method of adding UERV to existing school classroom



U11 Series for 600 - 1000 CFM UERV for Ducted Applications

The U11 ducted series is designed for installations that require higher airflow. The air handler is installed on top of one end of the UERV. Return, intake, and exhaust air is ducted to the UERV. **Note: Applications with extensive duct on intake and exhaust may require booster fans. Field Transitioning Required.**



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 Standard 1010-2000 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. Each 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.

Exhaust Air Blower (direct drive)– UERV shall contain a centrifugal blower. All UERV's will be equipped with direct drive PSC blower motors. Each 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. Moor 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 28 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 "R" model stationary 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 UERVs' will have the balancing damper provided in the UERV.

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

UERV Support – All UERV's will be provided with support legs attached to the cabinet to support for the intake and exhaust end of the rooftop unit. Horizontal UERV'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 Mounting Frame – 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.