

## AIRXCHANGE GENERAL CAPABILITIES OVERVIEW

### 1. Product Name

- Airxchange Energy Recovery Wheel

### 2. Manufacturer

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### 3. Product Description

#### Basic Use:

Airxchange is a leading manufacturer of energy recovery wheels in North America. Energy Recovery wheels recycle energy from building exhaust to pre-treat fresh air prior to conditioning by an HVAC unit. Designed well, a system featuring energy recovery allows engineers to specify smaller and more efficient heating and cooling units, with the balance of the required air loads provided by the energy recovery device(s).

Airxchange provides a unique wheel design that allows for easy cleaning and maintenance to ensure optimal performance over the life of the HVAC system. The system includes removable energy transfer media, structural metal wheels, and permanently bonded desiccants that can be effectively washed without compromising performance.

Airxchange wheels provide:

- Up to 40 percent improved system efficiency
- Up to 75 percent improved dehumidification capacity
- First cost payback of 0-2 years

Energy recovery wheels may also be used to increase outdoor air ventilation rates in new or existing buildings without the need for additional energy. Outdoor air ventilation improves indoor air quality (IAQ) and improves the health and productivity of a building's occupants by reducing long and short term exposure to all indoor air pollutants.

#### OEM Product

Airxchange manufactures energy recovery wheels in a wide variety of configurations and sizes. Airxchange wheels are used by most major HVAC original equipment manufacturers (OEMs) to provide efficient ventilation solutions in standalone energy recovery ventilators, air handling systems, and packaged direct expansion units. Airxchange OEM products may be incorporated into the design of new or replacement HVAC Systems.



#### Replacement Wheel Service

Airxchange provides a factory direct replacement of any manufacturer's energy recovery wheel. A factory representative assists with wheel selection, performance modeling and on-site installation. For difficult to access areas, Airxchange provides a field assembled kit that transports through standard doorways with no special handling equipment for assembly on site.

#### Composition and Materials

##### Cassette Frame and Wheel Construction

- Cassette frame and structural components are constructed of galvanized steel
- Wheel structure including hub, spokes and rolled rim assembly are constructed from welded stainless steel or structural aluminum
- The wheel structure is connected to the shaft using taper-lock bushings
- Durable polymer energy transfer media is fabricated with alternating layers of flat and structural layers to form an ideal parallel plate geometry; maximum depth of energy transfer media is four inches
- Energy transfer media has a permanently bonded desiccant coating of either silica gel or molecular sieve
- Wheel diameters greater than 25 inches are designed with removable energy transfer segments for ease of cleaning
- Seals for all cassettes are factory set and consist of non-contact nylon pile brush oriented in a labyrinth style configuration
- The wheel drive system is a UL-recognized component and is mounted in the cassette frame and includes a service connections or junction box

**Table 1—Standard Matrix Models**

			Electrical Configuration					
Model	Media	Max. Airflow (cfm)	115V 1Ph 50/60 Hz	208-230V 1Ph 50/60 Hz	460V 1Ph 60Hz	200/208 -230V 3Ph 50/60 Hz	200-230/475V 3Ph 50/60 Hz	Other (see notes*)
1 inch Series								
ERC-15	Monolithic	400	Optional	Optional	—	—	—	1
ERC-19	Monolithic	800	Optional	Optional	—	—	—	1
ERC-21	Monolithic	900	Optional	Optional	—	—	—	1
1½ inch Series								
ERC-36	Segmented	2300	Optional	Optional	Optional	Optional	Optional	1, 3
ERC-52	Segmented	4500	Optional	Optional	Optional	Optional	Optional	1, 3
ERC-58	Segmented	6000	Optional	Optional	Optional	Optional	Optional	1, 3
2 inch Series								
ERC-19	Monolithic	800	Optional	Optional	—	—	—	1
ERC-21	Monolithic	950	Optional	Optional	—	—	—	1
ERC-25	Monolithic	1100	Optional	Standard	—	—	—	1
3 inch Series								
ERC-25	Segmented	1300	Optional	Optional	—	—	—	1, 2, 3
ERC-30	Segmented	1900	Optional	Optional	—	—	—	1, 2, 3
ERC-36	Segmented	3400	Optional	Optional	Optional	Optional	Standard	1, 2, 3
ERC-41	Segmented	4200	Optional	Optional	Optional	Optional	Standard	1, 2, 3
ERC-46	Segmented	5200	Optional	Optional	Optional	Optional	Standard	1, 2, 3
ERC-52	Segmented	7500	Optional	Optional	Optional	Optional	Standard	1, 2, 3
ERC-58	Segmented	9000	Optional	Optional	—	Optional	Standard	1, 2, 3
ERC-64	Segmented	10,000	Optional	Optional	—	Optional	Standard	1, 2, 3
ERC-68	Segmented	12,000	Optional	Optional	—	Optional	Standard	1, 2, 3
ERC-74	Segmented	14,000	Optional	Optional	—	Optional	Standard	1, 2, 3
* Notes: 1. Optional media configuration; sensible. 2. Optional cassette configuration; double wall. 3. Optional electrical 3Ph configuration; inverter duty.								

\*Notes: 1. Optional media configuration; sensible. 2. Optional cassette configuration; double wall. 3. Optional electrical 3Ph configuration; inverter duty.

## Finishes

The cassette frames supporting energy recovery wheels are a galvanized steel G90 finish with an option for powder coating.

## Benefits

- Cassette design for easy removal and cleaning of energy transfer media as needed
- Ability to self clean from dry dust and dirt
- Reduced loads at design allow significant downsizing of the heating and cooling plant
- Energy efficient ventilation reduced operating costs
- Reduced design loads and operating costs combine for rapid payback
- Increased ventilation improves indoor air quality
- Greater efficiency permits raising the outdoor air quantity without increasing the heating/cooling plant; this makes it ideal for new systems as well as retrofit applications
- Reduced greenhouse gas emissions for a cleaner environment

## Durability

- Stainless steel welded wheel construction and patented polymer energy transfer media is impervious to corrosion; even in coastal marine environments
- G90 galvanized cassette frame offers industry leading corrosion resistance with powder coating option
- Patented process permanently bonds silica gel desiccant to the energy transfer media; even after repeated washings over years of operations, the desiccant remains in place; third-party study confirmed
- Self-aligning permanently lubricated bearings with a minimum L-10 design life of 30 years

**Table 2—Channel Matrix Models**

Electrical Configuration*								
Model	Media	Max. Airflow (cfm)	115V	208-23	460V	200/208 -230V	575V	Other (see notes*)
			1Ph 50/60 Hz	0V 1Ph 50/60 Hz	1Ph 60Hz	3Ph 50/60 Hz	3Ph 60 Hz	
3 inch Series								
ERC-25C	Segmented	1300	Optional	Optional	—	—	—	1, 2, 3
ERC-30C	Segmented	1900	Optional	Optional	—	—	—	1, 2, 3
ERC-36C	Segmented	3400	Optional	Optional	Optional	Optional	Optional	1, 2, 3, 4
ERC-41C	Segmented	4200	Optional	Optional	Optional	Optional	Optional	1, 2, 3, 4
ERC-46C	Segmented	5200	Optional	Optional	Optional	Optional	Optional	1, 2, 3, 4
ERC-52C	Segmented	7500	Optional	Optional	Optional	Optional	Optional	1, 2, 3, 4
ERC-58C	Segmented	9000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-64C	Segmented	10,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-68C	Segmented	12,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-74C	Segmented	14,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-81C	Segmented	17,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-86C	Segmented	19,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-92C	Segmented	21,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-99C	Segmented	25,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-104C	Segmented	27,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-110C	Segmented	31,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-118C	Segmented	45,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4
ERC-125C	Segmented	54,000	Optional	Optional	—	Optional	Optional	1, 2, 3, 4

\* Notes: 1. Optional media configuration; sensible.  
 2. Optional cassette configuration; double wall.  
 3. Optional cassette configuration; purge.  
 4. Optional electrical 3Ph configuration; inverter duty.  
 5. Standard configuration; AC/DC inverter duty.

**Table 3—Cassette Dimensions; Monolithic Wheels**

Model	Wheel Depth (inches)	# of Models	Frame Height (inches)	Frame Width (inches)	Frame Depth (inches)	Maximum Weight (lbs.)
ERC-15	1	1	18.5	18.5	4.54	11
ERC-19	1	1	22.5	22.5	4.54	17
ERC-21	1	1	24.25	24.25	4.54	22
ERC-19	2	1	22.5	22.5	6.53	22
ERC-21	2	1	24.25	24.25	6.53	27
ERC-25	2	1	29	29	6.53	22

**Table 4—Cassette Dimensions; Segmented Wheels**

Model	Wheel Depth (inches)	# of Models	Frame Height (inches)	Frame Width (inches)	Frame Depth (inches)	Maximum Weight (lbs.)
ERC-25	3	3	29	29	5.6	36
ERC-30	3	3	34	34	5.6	61
ERC-36	1.5	2	40	40	7.0	80
ERC-36	3	4	40	40	7.0	118
ERC-41	3	4	44	44	7.5	170
ERC-46	3	4	50	50	7.5	185
ERC-52	1.5	2	56	56	7.5	188
ERC-52	3	4	56	56	7.5	220
ERC-58	1.5	1	62.5	62.5	8.5	290
ERC-58	3	4	62.5	62.5	10	320
ERC-64	3	4	68	68	10	344
ERC-68	3	4	72	72	11	408
ERC-74	3	4	78	78	11	454
ERC-81	3	3	85	85	13	580
ERC-86	3	3	91	91	13	656

**Table 5—Cassette Dimensions; Satellite Segmented Wheels**

Model	Wheel Depth (inches)	# of Models	Frame Height (inches)	Frame Width (inches)	Frame Depth (inches)	Max Weight (lbs.)
ERC-92	3	3	96	96	16	858
ERC-99	3	3	104	104	16	921
ERC-104	3	3	108	108	20.5	984
ERC-110	3	3	115	115	20.5	1100
ERC-118	3	3	126	126	20.5	1400
ERC-125	3	3	134	134	22	1450

**Maintainability**

- Segmented energy recovery wheel transfer media can be easily removed by one person for cleaning or replacement, minimizing downtime to as little as 15 minutes
- Complete cassette includes: polymer energy transfer segments, structural metal wheel, rigid frame, bearings, seals, motor and drive belt
- Link belt is self-tensioning and maintenance free with a minimum expected life of ten years

**Product Limitations**

Product should not be used with Class 4 exhaust air. Operating temperatures range -30 - 150 degrees F (call factory for operation outside this range). Maximum airflow/pressure drop should not exceed 1.25 inch WC

**Standard Models Duty and Electrical Configuration Options**

See Table 1 and Table 2

**Dimensions**

See Table 3, Table 4 and Table 5

**4. Technical Data****Applicable Standards****American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)**

- **ASHRAE 84** Method of testing Air-to-Air Heat Exchangers (ANSI Approved)





### Air-Conditioning Heating and Refrigeration Institute (AHRI)

- **AHRI 1060** Performance Rating of Air-to-Air Heat Exchangers for Energy Recovery Ventilation Heat Equipment

### Certification Compliance to Path A

- Airxweb software provides AHRI certified performance for your products over the entire range of operation
- Ensures that all configurations of products can be rated for the entire map of performance

### National Fire Protection Association (NFPA)

- **NFPA 90A** Standard for the installation of Air-Conditioning and Ventilating Systems

### Underwriter's Laboratories (UL)

- **UL 900** Test Performance of Air Filter Units
- **UL 1812** Ducted Heat Recovery Ventilators
- **UL 1815** Nonducted Heat Recovery Ventilators

### Approvals

- UL Recognized Component by Underwriters Laboratories
- ULC Recognized Component by Underwriters Laboratories of Canada

## 5. Installation

### Orientation

The cassette may be mounted in any orientation.

### Lifting and Support

When lifting larger cassettes, ensure the provided lifting holes in the bearing beams are used as shown in Figure 1. After installation, be sure that the distance between wheel rim and bearing beam is the same at each end of one bearing beam to within 1/4 inch. A small amount of racking can be compensated for by adjusting the diameter seals.

## 6. Availability and Cost

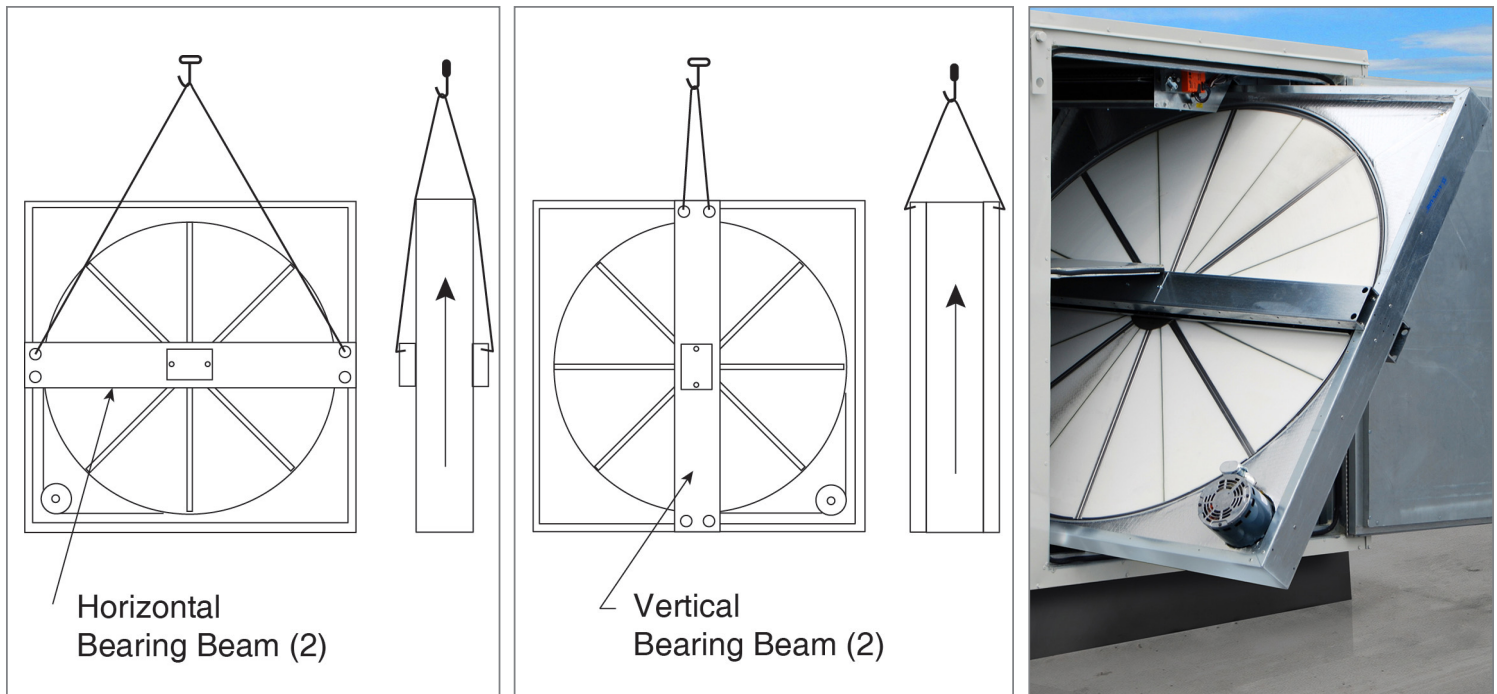
HVAC OEM Product is available through most commercial HVAC equipment manufacturers as the energy recovery component in standalone energy recovery ventilators, packaged DX units, air handlers and rooftop accessories. Airxchange replacement wheels and replacement parts are available from Airxchange. Visit [www.Airxchange.com](http://www.Airxchange.com) for more information.

## 7. Warranty

Airxchange warrants all parts and components of its Energy Recovery Cassettes to be free from defects in quality of work and materials under normal service usage for a period of (5) five years from the date of manufacture.

## 8. Maintenance

All air-to-air energy recovery devices get dirty over time, even with well-maintained filtration. Regular inspection, maintenance and cleaning, when required, is essential to the efficiency of energy wheels. The environment in which the energy wheel is working in affects the inspection and cleaning schedule as well as the type of cleaning required.



**Figure 1: Lifting hole locations**

**(maintenance cont.)**

For dry dust situations in wheels with a laminar flow matrix design it may be as simple as rotating the wheel between opposing air streams traveling from 500-800 fpm if inspections are done regularly and dust is not allowed to build up.

In situations where oil and grease are in the air stream and are deposited on the rotary surface, the surface becomes "sticky" and attracts and holds dust which would normally pass through the media. This build up can lead to blocked airflow passages, loss of recovery, excessive pressure drop and loss of energy savings. The energy wheel then needs to be thoroughly cleaned.

**Cleaning Procedure:**

- Access the energy recovery wheel and remove the energy transfer matrix segments; for one-piece wheels  $\leq 25$  inches in diameter, remove the wheel from the cassette
- Brush the wheel face to remove loose accumulated dirt and dust
- Wash the segments or small wheels with non-acid based (evaporator) coil cleaner or alkaline detergent solution; non-acid based coil cleaner such as KMP Acti-Clean AK-1 concentrate in a five percent solution has been demonstrated to provide excellent results
- Do not use acid-based cleaners, aromatic solvents, steam or temperatures  $\geq 170$  degrees F as wheel damage may result

- Soak in cleaning solution until grease and tar deposits are loosened; an overnight soak may be required to loosen heavy deposits of tar and oil-based contaminants
- Internal heat exchange surfaces may be examined by separating the polymer strips by hand: note: some staining of the desiccant may remain and is not harmful to performance
- After soaking, rinse the dirty solution from the wheel until water runs clear
- Allow excess water to drain prior to replacing segments in the wheel or reinstalling the wheel in the cassette; a small amount of water remaining in the wheel will be dried out by the airflow

Visit [www.Airxchange.com/upgrade-to-airxchange](http://www.Airxchange.com/upgrade-to-airxchange) for additional cassette maintenance service support and videos.

## 9. Technical Services

Airxchange has a full service department to assist HVAC OEM customers and field service technicians. Also available is a direct replacement service of other manufacturer's energy recovery wheels.