

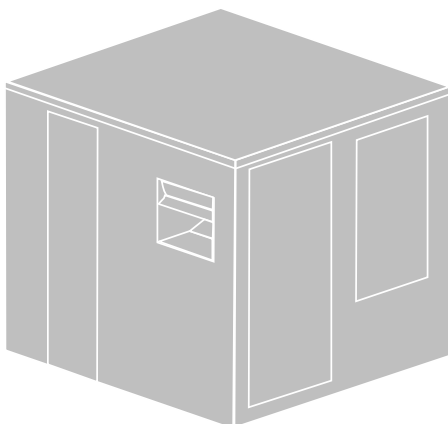
ERV



COOK

ERV

Energy Recovery Ventilator

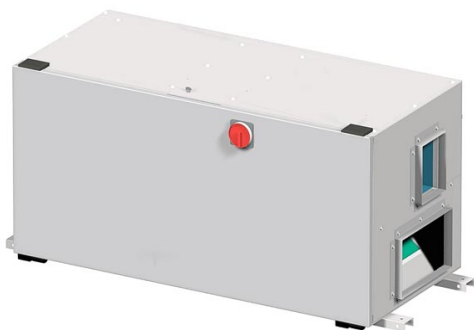


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ERV Introduction

A challenge facing today's HVAC engineer is how to meet ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, while conserving valuable energy resources needed to condition that outdoor air. Loren Cook Company's Energy Recovery Ventilator (ERV) provides an economical solution to this design challenge. The ERV offers a wide performance range, high pressure capabilities, and high energy recovery efficiencies. This product delivers where it counts most - first cost savings, performance efficiencies, durability, and easy maintenance. The Cook ERV is available in two direct drive sizes and eight belt drive sizes ranging from 500 to 10,000 cfm.

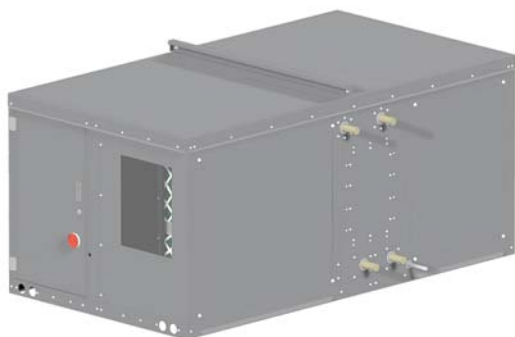
The primary component of the ERV is a durable, rotating enthalpy wheel. The wheel features a spirally wound, fluted air channel design providing ultra low pressure drop and eliminates lateral leakage within the wheel. The mass provided by the 4" wheel depth allows for excellent sensible heat transfer. The manufacturing process used to create the wheel media is unique to the industry, allowing synthetic absorption type desiccant to be combined with synthetic fiber substrate while it is still a liquid. This process distributes a much higher volume of desiccant throughout the media, not just on the surface, resulting in excellent latent heat transfer. This also assures that the media will not suffer any degradation in adsorption performance during its long and trouble free operating lifetime.



Direct Drive
ERV-500 and ERV-1000



Belt Drive
ERV-1500 through ERV-10000



Belt Drive
with Coil Option
ERV-1500 through ERV-10000

Standard Construction Features

- **Energy Recovery Wheel**
Wheel media is constructed of a unique fluted synthetic fiber-based media impregnated with a non-migrating water selective 4 angstrom (Å) molecular sieve desiccant (typical flute size is 6 mils).
- **Energy Recovery Cassette**
The cassette assembly consists of an energy recovery wheel, drive motor, and drive components which include pulleys, belts and bearings. The cassette assembly slides out for easy access.
- **Supply and Exhaust Blower Assemblies**
All blowers are centrifugal forward curved type with painted steel housings. The wheels are balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.
- **Cabinet**
The cabinet is constructed of minimum 18 gauge galvanized steel panels bolted to a minimum 16 gauge galvanized steel base. The entire cabinet is insulated with 1" thick, 3 lb. density, foil faced insulation. A hinged door is provided for access to the electrical control panel. Removable doors are provided for access to all other internal components.
- **Filters**
Filters are furnished in both the supply and exhaust airstreams. Standard 2" thick, 30 percent efficient pleated filters are utilized to maintain the efficiency of the energy recovery wheel. Air performance data includes the initial pressure drop of the air filters.
- **Controls and Electrical**
All internal electrical components are pre-wired for single-point power connection. Control panel is UL listed with hinged access door and interlocking NEMA 3R disconnect switch. Control panel is standard on belt drive units & optional on direct drive units.
- **Certifications**
Energy transfer ratings are ARI certified in accordance with the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program, based on ARI Standard 1060-2000 and ASHRAE 84-1991. Air performance is assured through compliance with the AMCA Certified Ratings Program. All Cook ERV units are UL and cUL listed.

ERV Typical Applications

- | | | | |
|-------------------|-----------------|---------------|--------------------------|
| ● Libraries | ● Schools | ● Auditoriums | ● Convention Centers |
| ● Museums | ● Offices | ● Gymnasiums | ● Health Care Facilities |
| ● Night Clubs | ● Hotels | ● Restaurants | ● Manufacturing Plants |
| ● Smoking Lounges | ● Retail Stores | | |

ERV with Coil Option - Typical Applications

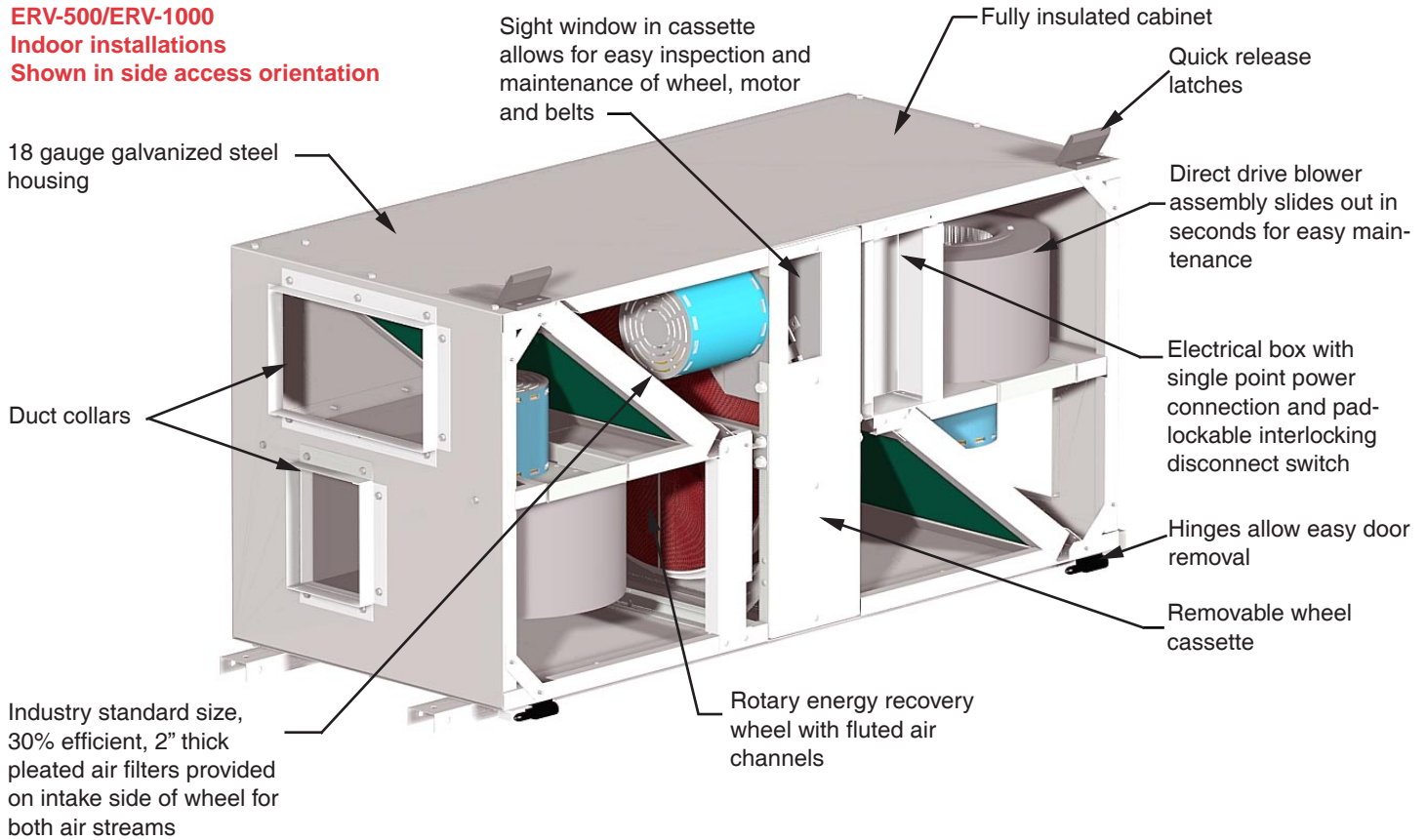
- Typical applications include all those listed above while also adding the convenience of installing one stand alone unit to supply air at the desired room conditions.
- Eliminates the need for separate HVAC equipment by integrating it into the ERV unit, minimizing the total number of roof penetrations in rooftop applications or the total amount of floor space required in indoor applications.

Direct Drive

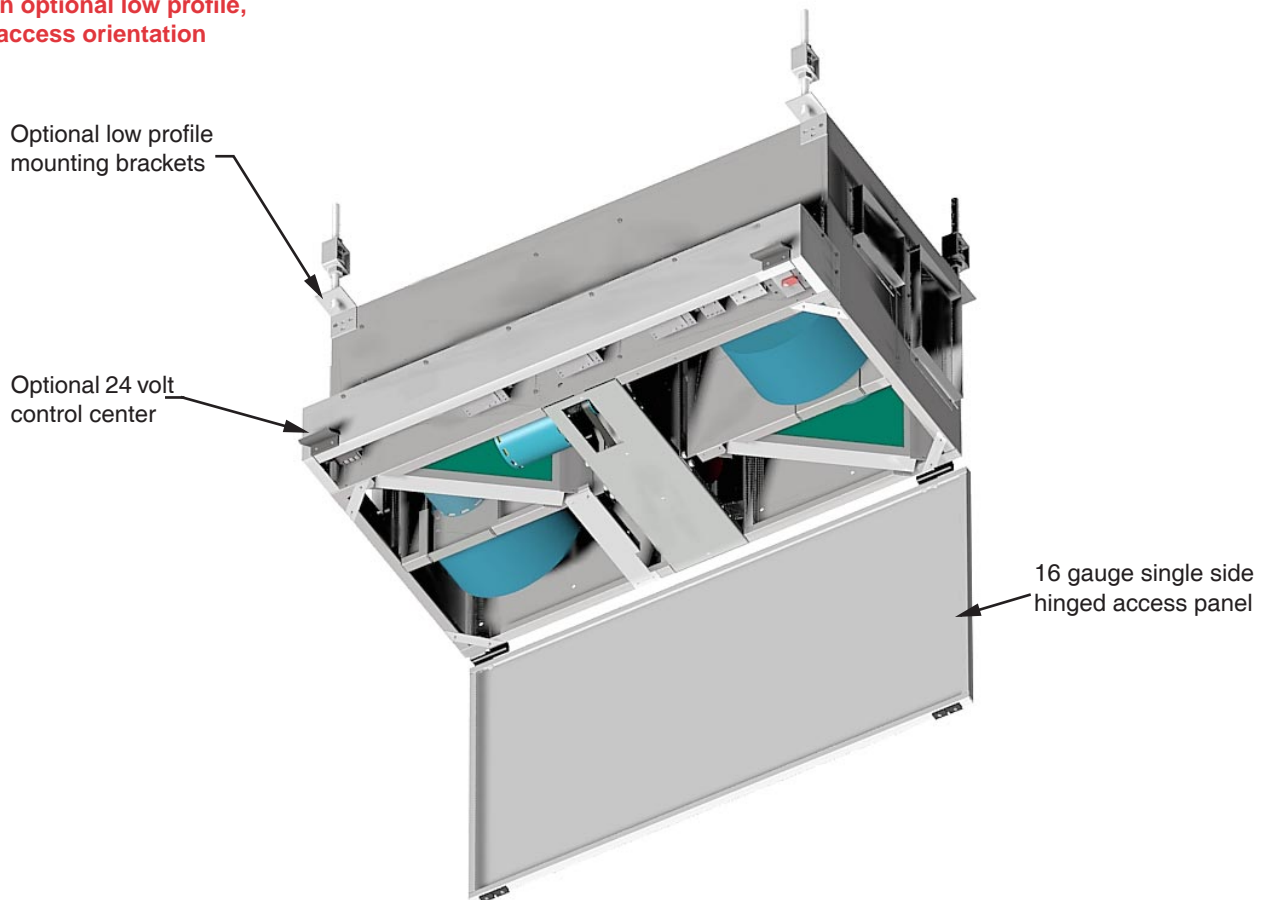
ERV-500/ERV-1000

Indoor installations

Shown in side access orientation



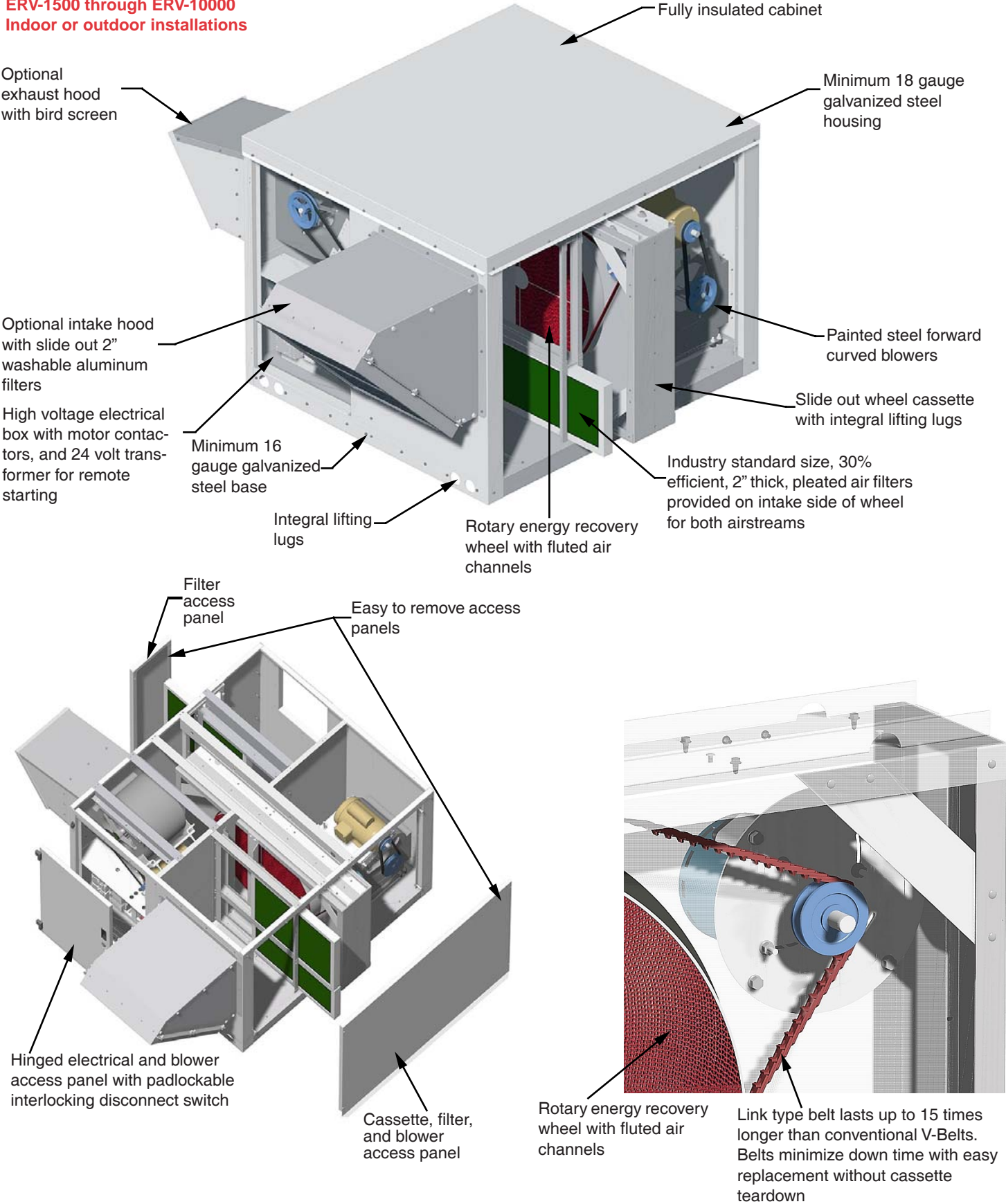
ERV-500/ERV-1000 Direct Drive
Shown in optional low profile,
bottom access orientation



ERV Standard Construction Features

Belt Drive

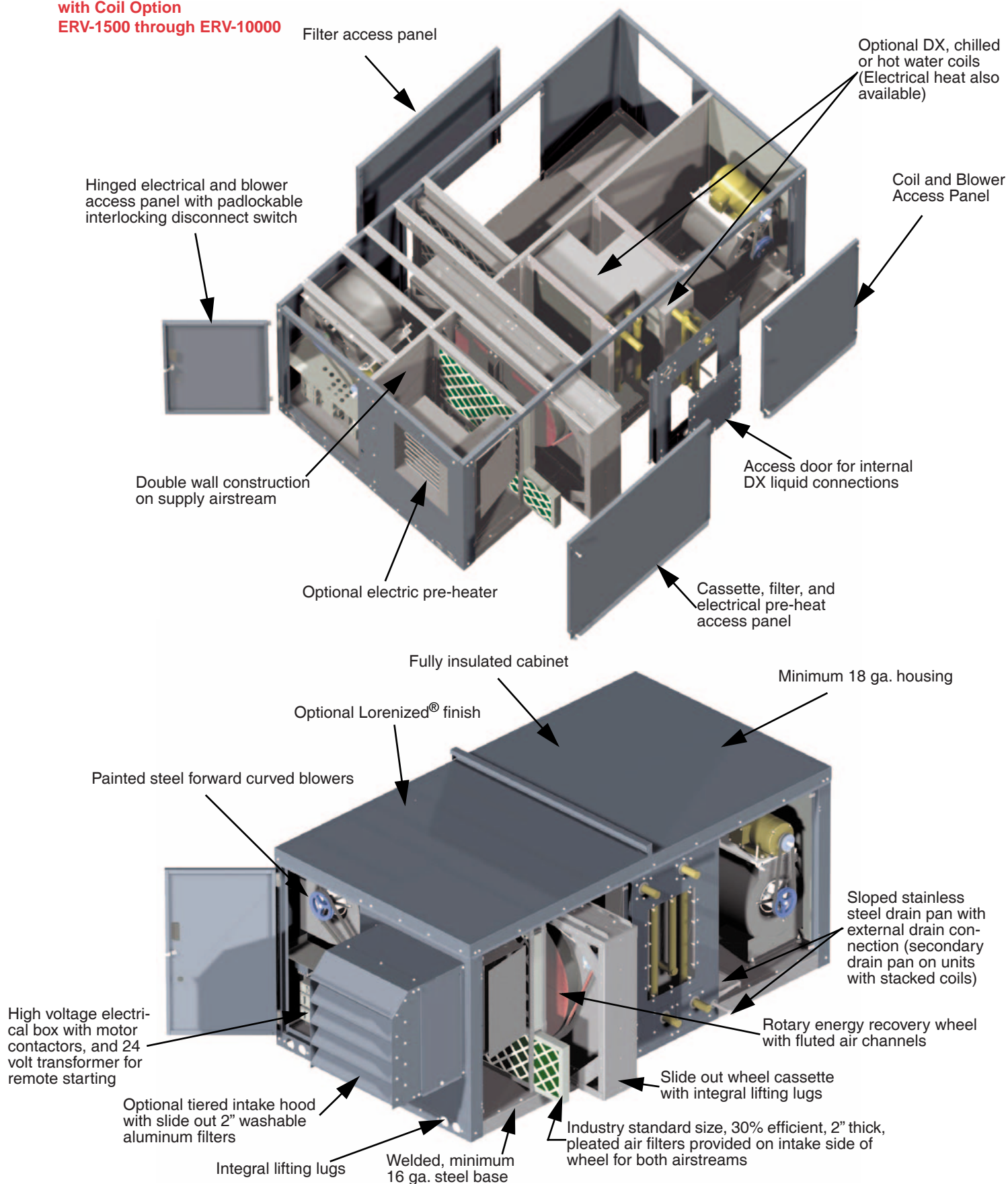
ERV-1500 through ERV-10000
Indoor or outdoor installations



Belt Drive

with Coil Option

ERV-1500 through ERV-10000



ERV Summer/Winter Modes

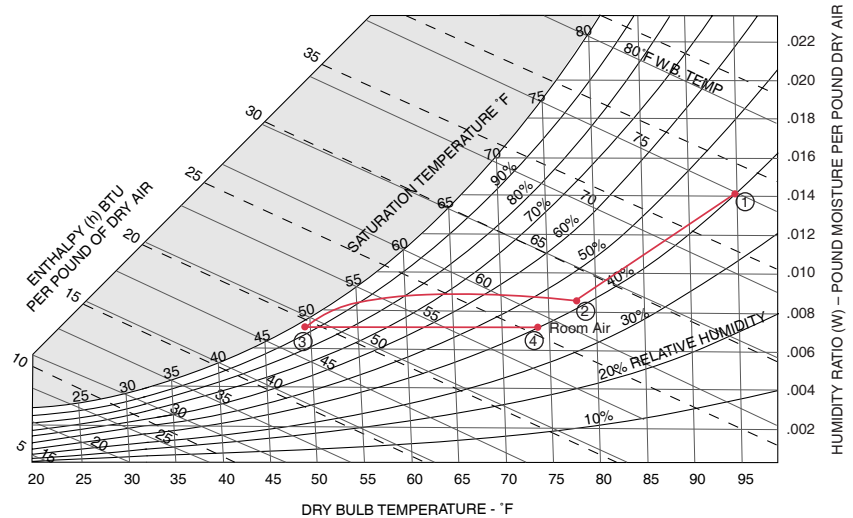
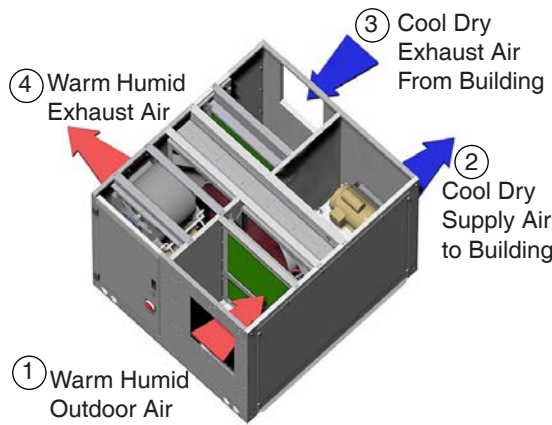
How the Energy Recovery Unit Works

The ERV has two separate airstreams, an exhaust airstream and a supply airstream. The primary feature of the ERV is an enthalpy wheel that rotates slowly (45 RPM) through both airstreams. The wheel has small passageways or flutes that the air flows through. As air passes through the wheel, the wheel captures heat and moisture from the warm airstream then releases it into the cool airstream. Positive seals around the wheel assure minimal cross leakage between the exhaust and supply airstreams.

The mass of the wheel captures heat in one airstream and releases it into the cooler airstream. This is defined as **sensible heat transfer**. The wheel also adsorbs moisture from one airstream and releases it into the dryer airstream. This is defined as **latent heat transfer**. The total energy transferred from one airstream to the other is the sum of the sensible and latent energy transfer. This is defined as the **total heat transfer**. The measure of an ERV's heat transfer performance is defined as the **percent effectiveness**. The examples below illustrate the ERV's performance in both summer and winter modes.

Summer

- Cools incoming outdoor air through sensible heat transfer and lowers humidity through latent heat transfer. Effectiveness rates are up to 85 percent.
- Allows engineers to reduce HVAC equipment peak load requirements by up to 4 tons per 1,000 CFM of exhaust air.
- The ERV is an ideal solution for reducing HVAC equipment size and maintaining relative humidity levels below 50 percent.



Psychrometric Chart Illustrating Typical ERV Summer Performance

A = Energy required to condition outdoor air to indoor air conditions.

B = Energy reclaimed by an ERV.

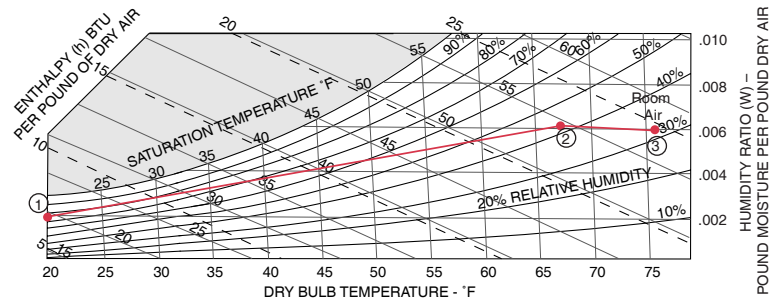
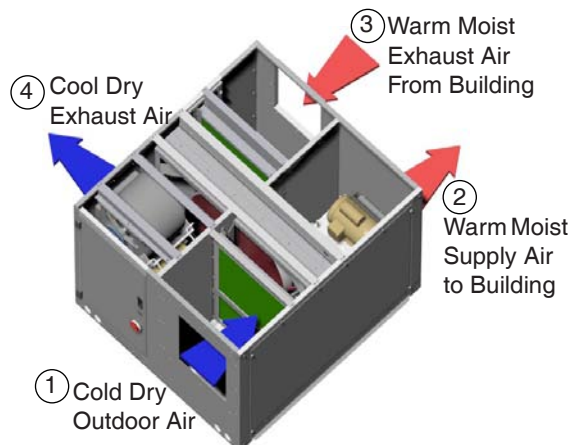
$$\% \text{Effectiveness} = \frac{B}{A} = \frac{h_2 - h_1}{h_3 - h_1}$$

Note: For unequal airflow the effectiveness will increase in the airstream with the lower airflow and will decrease in the airstream with the higher airflow.

- ① 95°F dry bulb, 75°F wet bulb, 40% RH, .014 (lb./lb.), 99 (grains/lb.), 38 (BTU/lb.)
- ② 78°F dry bulb, 62°F wet bulb, 41% RH, .008 (lb./lb.), 59 (grains/lb.), 28 (BTU/lb.)
- ③ 75°F dry bulb, 60°F wet bulb, 40% RH, .007 (lb./lb.), 52 (grains/lb.), 26 (BTU/lb.)

Winter

- Warms incoming outdoor air through sensible heat transfer and raises humidity through latent heat transfer. Effectiveness rates are up to 85 percent.
- Allows building owners to conserve up to 60,000 BTU per 1,000 CFM.
- The ERV is an ideal solution for reducing energy use and maintaining relative humidity levels above 25 percent.



Psychrometric Chart Illustrating Typical ERV Winter Performance

A = Energy required to condition outdoor air to indoor air conditions.

B = Energy reclaimed by an ERV.

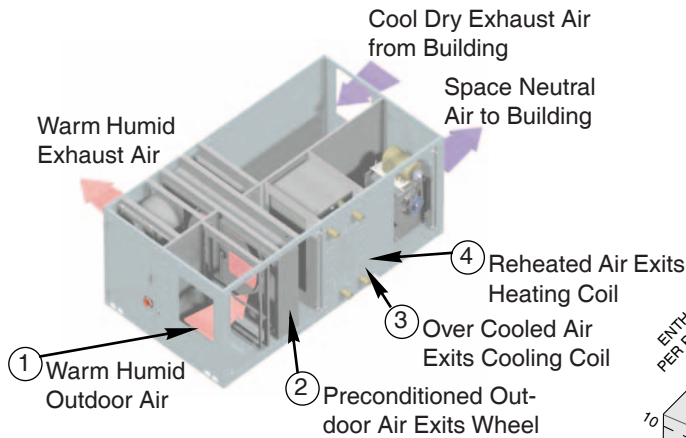
$$\% \text{Effectiveness} = \frac{B}{A} = \frac{h_2 - h_1}{h_3 - h_1}$$

Note: For unequal airflow the effectiveness will increase in the airstream with the lower airflow and will decrease in the airstream with the higher airflow.

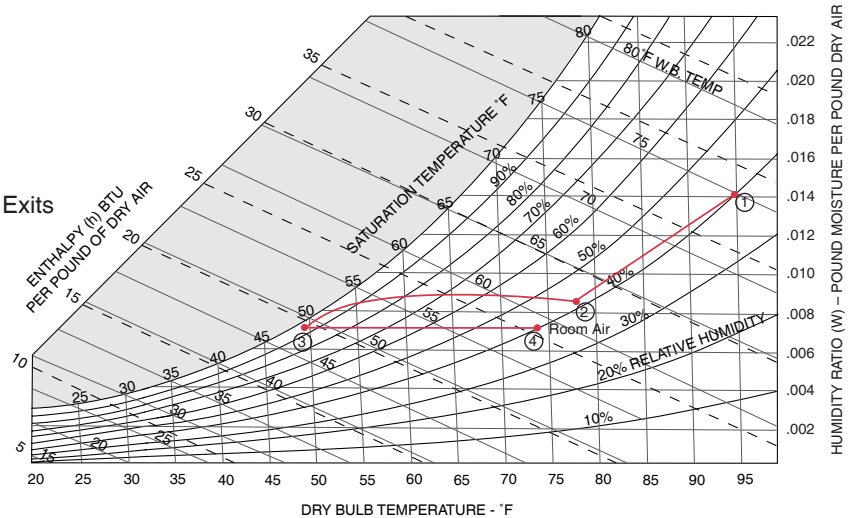
- ① 20°F dry bulb, 18°F wet bulb, 75% RH, .002 (lb./lb.), 11 (grains/lb.), 7 (BTU/lb.)
- ② 67°F dry bulb, 54°F wet bulb, 43% RH, .006 (lb./lb.), 42 (grains/lb.), 23 (BTU/lb.)
- ③ 74°F dry bulb, 59°F wet bulb, 38% RH, .007 (lb./lb.), 48 (grains/lb.), 25 (BTU/lb.)

Summer/Winter Modes with Optional Coil Section **ERV**

Summer Cooling - Options include: DX or Chilled water coil

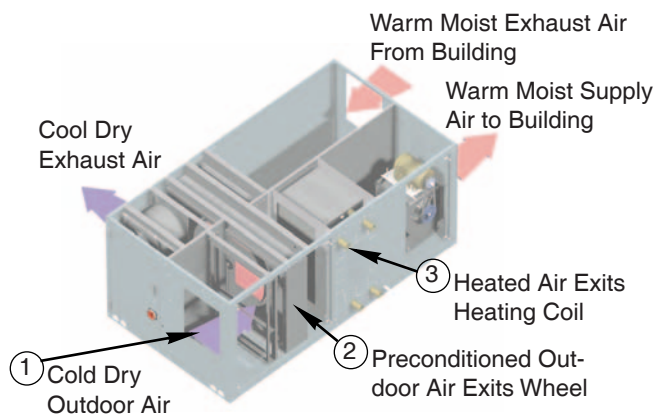


- The cooling coil further cools and dehumidifies the incoming air.
- A heating coil can reheat the overcooled air to space neutral conditions at the supply outlet.
- Allows engineers to specify one unit for their energy recovery and cooling needs.
- Helps simplify the overall HVAC design from specification to final installation.
- The ERV with Coil Option is an ideal solution for applications that require 100% outdoor air.

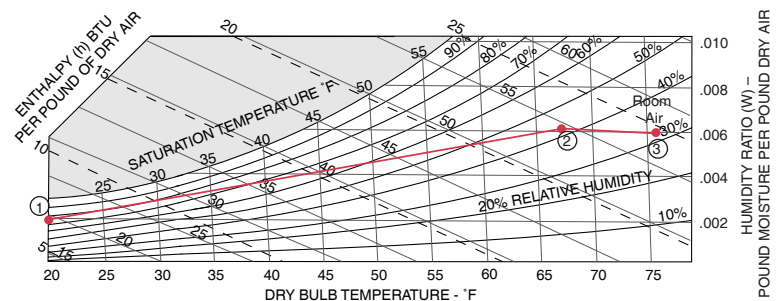


- ① 95°F dry bulb, 75°F wet bulb, 40% RH, .014 (lb./lb.), 99 (grains/lb.), 38 (BTU/lb.)
- ② 78°F dry bulb, 62°F wet bulb, 41% RH, .008 (lb./lb.), 59 (grains/lb.), 28 (BTU/lb.)
- ③ 48.73°F dry bulb, 48.7°F wet bulb, 100% RH, 0.0073 (lb./lb.), 50.9 (grains/lb.), 19.6 (BTU/lb.)
- ④ 74.45°F dry bulb, 59°F wet bulb, 39.3% RH, 0.0073 (lb./lb.), 49.7 (grains/lb.), 25.7 (BTU/lb.)

Winter Heating - Options include: Electric or hot water coil.



- The heating coil heats the air to space neutral conditions at the supply outlet.
- Allows engineers to design and specify only one unit for their energy recovery and heating needs.
- Heating coils can also be utilized during the summer for re-heat.



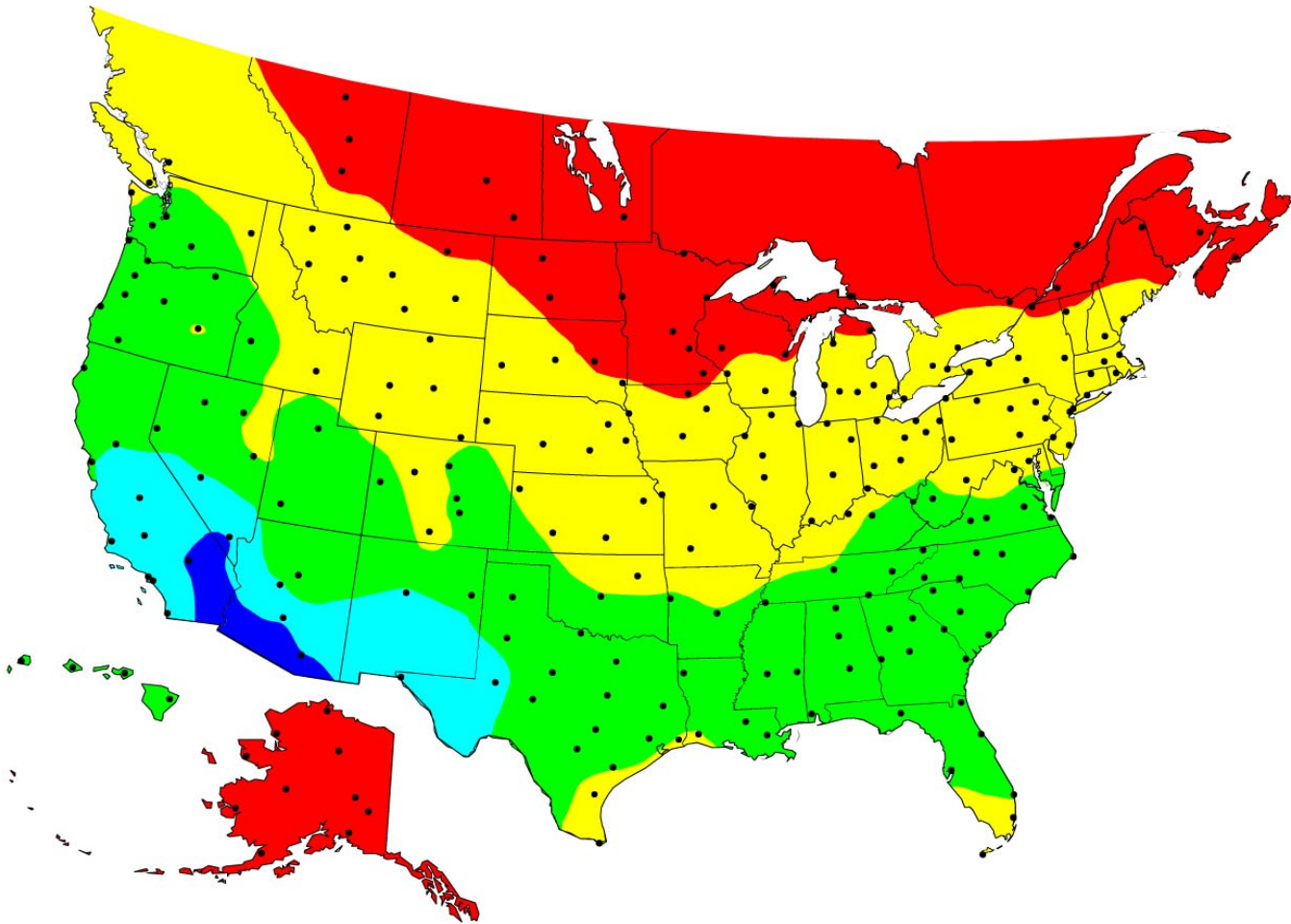
- ① 20°F dry bulb, 18°F wet bulb, 75% RH, .002 (lb./lb.), 11 (grains/lb.), 7 (BTU/lb.)
- ② 67°F dry bulb, 54°F wet bulb, 43% RH, .006 (lb./lb.), 42 (grains/lb.), 23 (BTU/lb.)
- ③ 76.9°F dry bulb, 57.5°F wet bulb, 31% RH, .006 (lb./lb.), 39.5 (grains/lb.), 24.78 (BTU/lb.)

ERV Annual Energy Savings

Ventilation rates prescribed by ASHRAE Standard 62 have required mechanical designers to significantly increase the amount of outdoor air provided to occupied spaces. The high efficiencies of energy recovery ventilators allow engineers to meet the ASHRAE 62 Standard and continue to design energy efficient structures. In the winter, heat and moisture recovered from the warm indoor exhaust air is transferred to the cold outdoor air being introduced into the building. With the heat transfer effectiveness as high as 85 percent, winter fuel bills can be drastically reduced while providing a healthy and comfortable indoor environment. Similar energy savings can be realized in the summer months as warm, humid outdoor air is cooled and dehumidified before it is introduced to the conditioned space, thus reducing air conditioning load.

The annual energy savings map illustrates how operating cost savings can be substantial. While energy savings are very good across the southern United States, they are excellent throughout the central and northern United States and all of Canada. Detailed analysis, including first cost and monthly heating and cooling savings for a specified application can be calculated using the Cook Compute-A-Fan selection software.






Annual Energy Savings Map



Operating Assumptions

This map illustrates typical annual energy savings (in dollars per 5,000 cfm) by location. The analysis is based on the following assumptions.

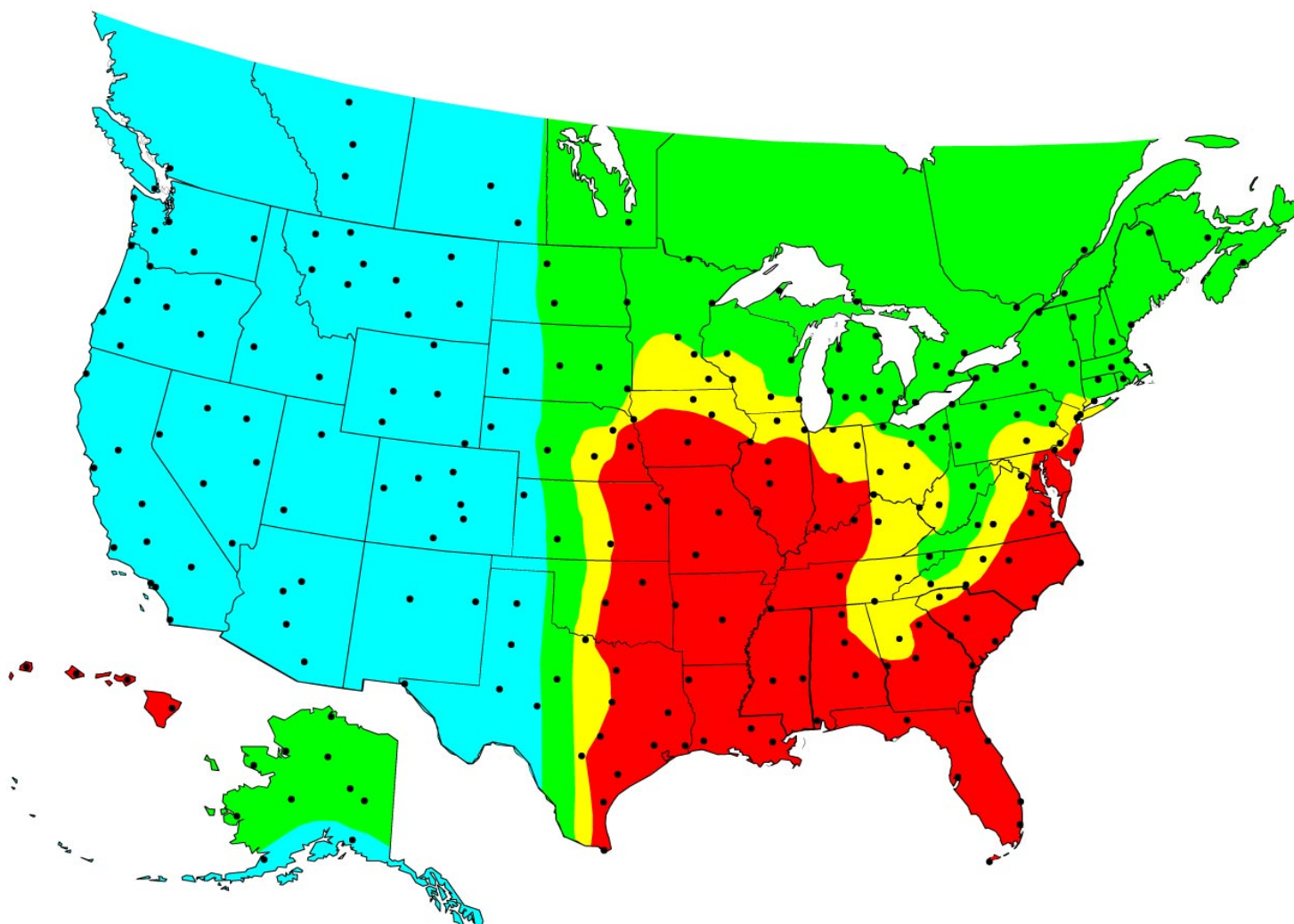
- Hours of operation: 6 a.m. to 10 p.m., five days per week
- Cooling source EER: 10.0
- Summer indoor design: 75° Dry Bulb, 50 percent Relative Humidity
- Electric cost: \$.07/kwh
- Winter indoor design: 72° Dry Bulb, 35 percent Relative Humidity
- Heating source: Gas, \$.60/therm.
- Wheel effectiveness: 75 percent latent and sensible
- Calculations include ERV operating costs

Savings per Year	
	\$0-500
	\$501-1500
	\$1501-2500
	\$2501-3500
	\$3501 +

Energy savings and initial equipment savings can be combined to calculate an attractive payback on the Cook ERV. When an ERV is incorporated into an HVAC system, air conditioning and heating equipment can be appropriately downsized. In the often hot and humid climates shown in red on the payback map, initial ERV cost will be offset by a decrease in air conditioning equipment cost resulting in immediate payback. In the climates indicated in yellow and green on the map, excellent operating cost savings allow ERV payback to be realized in 1 to 3 years.

Weather data for this analysis is based on Typical Meteorological Year (TMY2) data obtained from the National Renewable Energy Laboratory. This data was derived from the National Solar Radiation Data Base. It represents hourly typical weather conditions for the 239 North American cities illustrated on both the annual energy savings map and payback map. Summer design conditions are based on ASHRAE 97, 1 percent DB/MWB cooling conditions. Detailed analysis, including first cost and monthly heating and cooling savings for a specified application can be calculated using the Cook Compute-A-Fan selection software.

Payback Map



Operating Assumptions

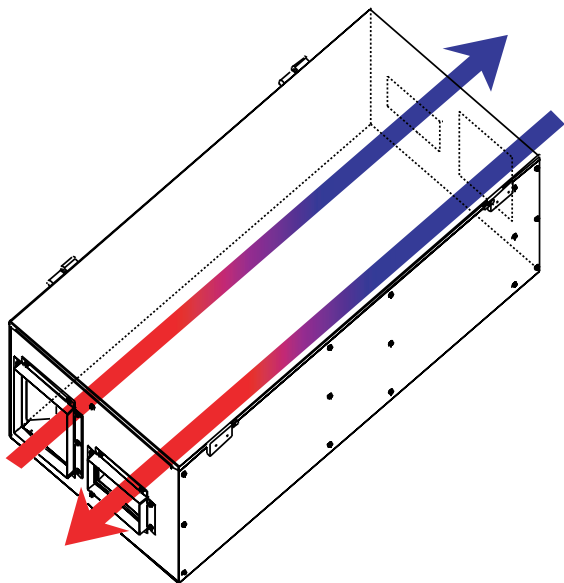
This map illustrates the time required to recover the ERV equipment cost. The analysis is based on the following assumptions.

- Hours of operation: 6 a.m. to 10 p.m., five days per week
- Cooling source EER: 10.0
- Summer indoor design: 75° Dry Bulb, 50 percent Relative Humidity
- Electric cost: \$.07/kwh
- Winter indoor design: 72° Dry Bulb, 35 percent Relative Humidity
- Heating source: Gas, \$.60/therm.
- Wheel effectiveness: 75 percent latent and sensible
- ERV installed cost: \$3/cfm
- A/C equipment installed cost: \$1,000/ton
- Calculations include ERV operating costs

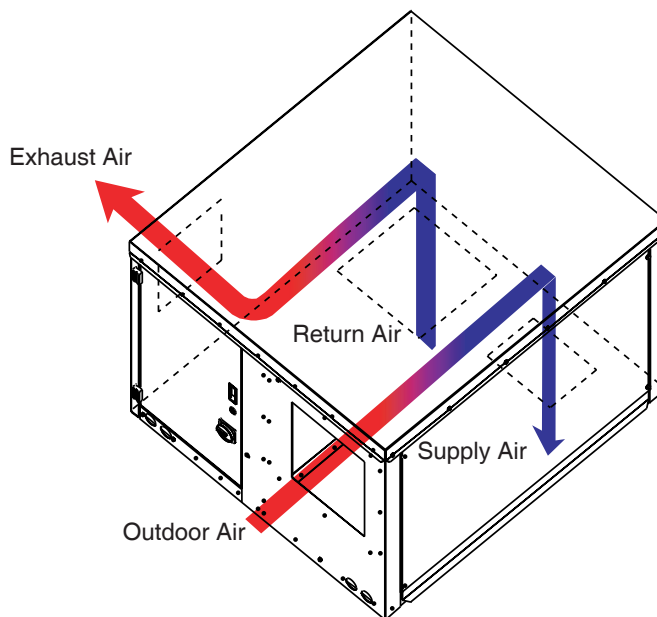
Payback Period in Years	
■	Instant
■	Less than 1 year
■	Less than 3 years
■	More than 3 years

ERV Arrangements

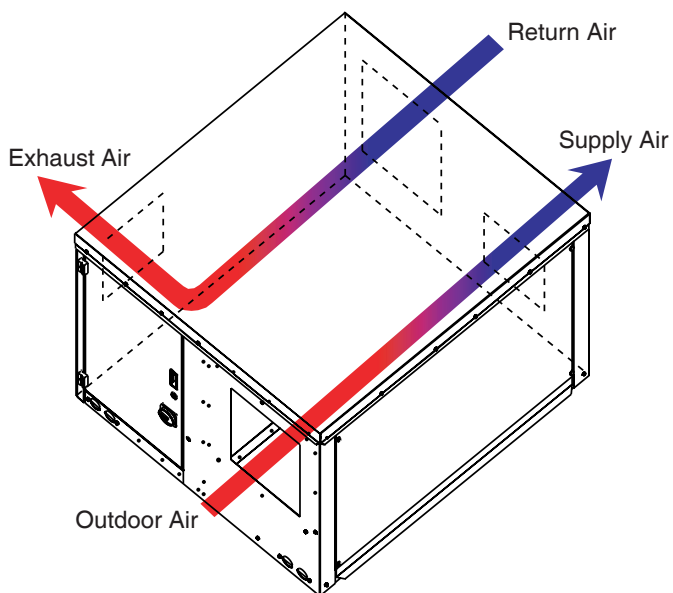
Cook Energy Recovery Ventilators offer flexibility to meet a wide variety of installation requirements. One direct drive and three belt drive ERV cabinet arrangements: **V (vertical)**, **H (horizontal)** and **C (combination)**, provide solutions for new, existing or future HVAC systems. (Consult Factory for other arrangements)



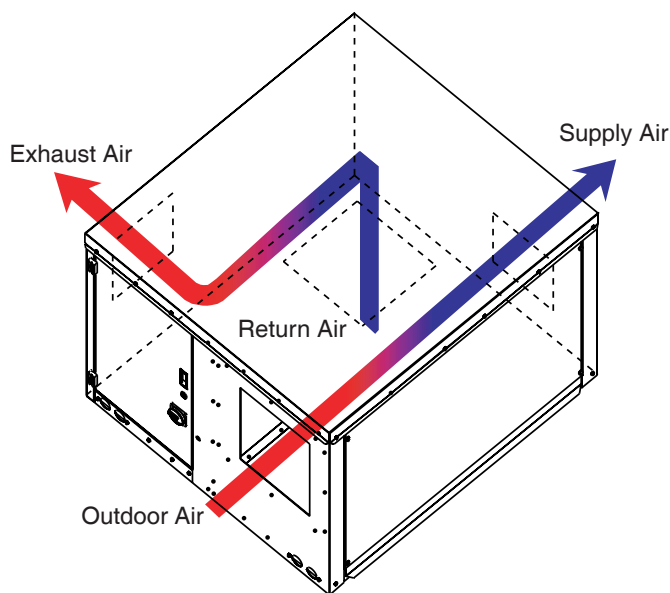
Direct Drive - Designed for indoor use and available in a horizontal airflow configuration. Installation flexibility allows either airstream to be used for supply or exhaust air.



Arrangement V - Provides vertical supply and return duct connections for belt drive units.

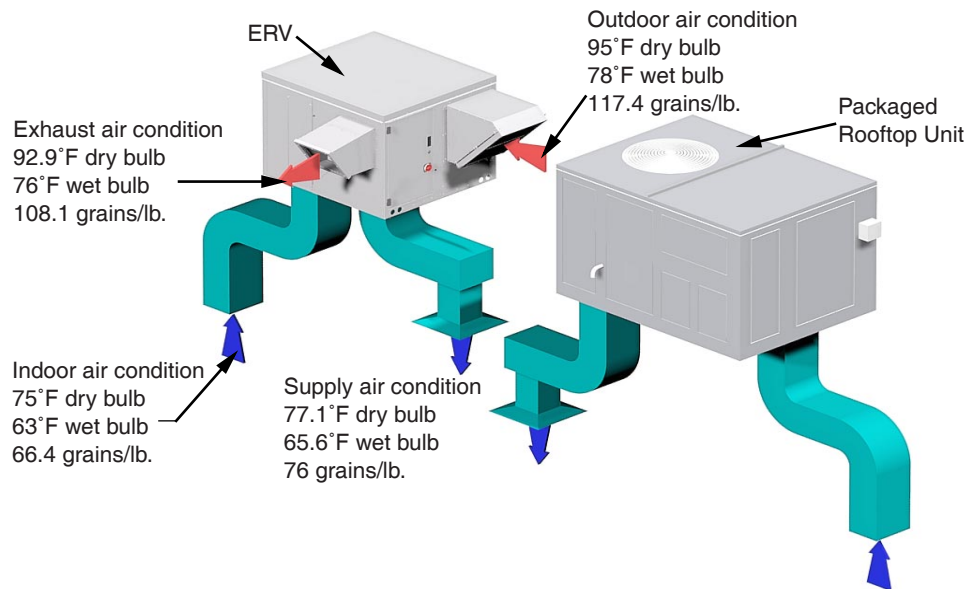


Arrangement H - Provides horizontal supply and return duct connections for belt drive units.

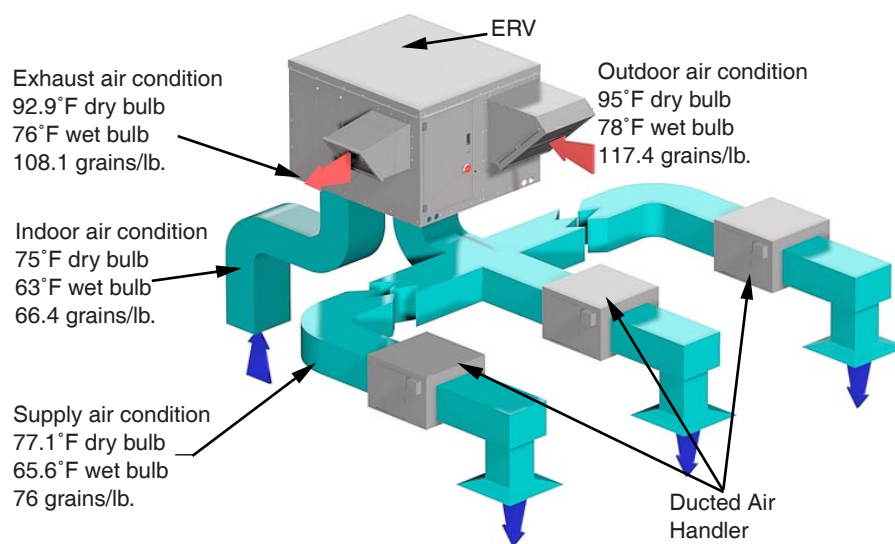


Arrangement C - Provides combination horizontal supply and vertical return duct connections for belt drive units.

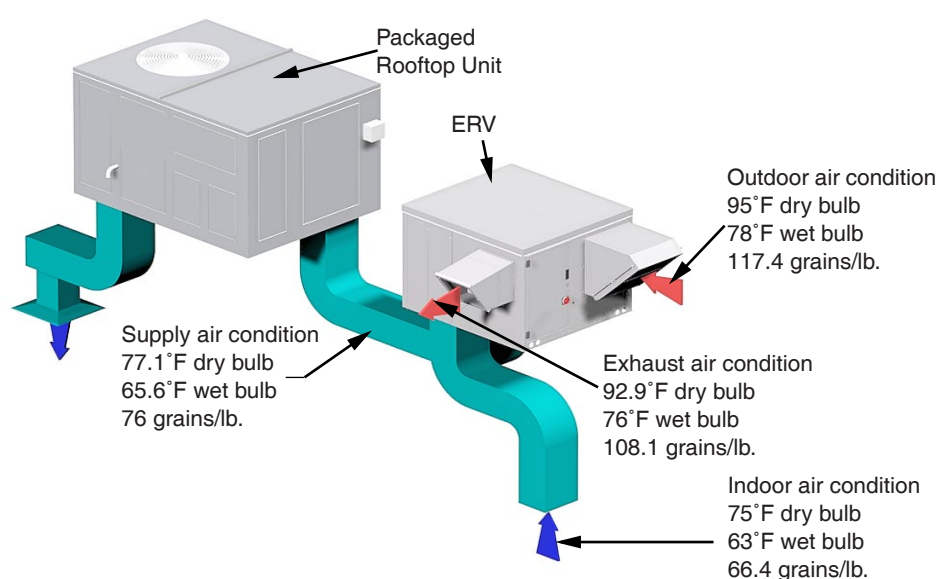
ERV Operating Independently of the HVAC System



ERV Supplying Ducted Air Handlers

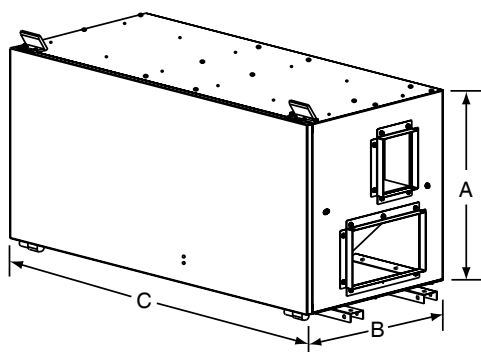


ERV Supplying a Packaged Rooftop Unit



ERV Specifications and Dimension Data

Energy Recovery Ventilator Direct Drive



Energy recovery component rated in accordance with ARI Standard 1060-2000 and certified to ARI. Actual performance in packaged equipment may vary.



Loren Cook Company certifies that the ERV shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.



Type ERV is furnished standard with UL 1812 listing (Ducted Heat Recovery Ventilators).



Type ERV is furnished standard with cUL 1812 listing (Ducted Heat Recovery Ventilators).

Description: Unit shall be a direct driven energy recovery ventilator.

Certifications: Unit shall be manufactured at an ISO 9001 certified facility. Unit shall be listed by Underwriters Laboratories (UL 1812) and UL listed for Canada (cUL 1812). Unit shall be ARI certified in accordance with the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program. Unit shall bear the AMCA Certified Ratings Seal for Air Performance.

Construction: The unit shall be of bolted construction utilizing corrosion resistant fasteners. Housing shall be minimum 18 gauge galvanized steel. Duct collars shall be provided as standard. Unit shall be provided with insulated top, side and interior panels utilizing 1" thick, three pound density foil faced insulation, manufactured and tested to meet NFPA 90A and UL 181 requirements. Insulation shall be fastened to the panels with weatherproof adhesive and weld pins. Energy recovery wheel shall be mounted in a slide track for easy inspection and cleaning. Separate blower and motor shall be provided for supply and exhaust airstream for independent system balancing. Blower and motor assemblies shall slide out for easy inspection. Two inch thick, 30 percent efficient pleated filters shall be provided for supply and exhaust airstreams. Entire side panel shall be hinged and removable for single side access to internal components. Unit shall bear an engraved aluminum nameplate and shall be shipped in ISTA Certified Transit Tested Packaging.

Energy Wheel: Wheel shall be a total energy recovery wheel constructed of fluted synthetic fiber-based media impregnated with a non-migrating water selective 4 angstrom molecular sieve desiccant. Wheels with the desiccant applied in a secondary operation will not be accepted. Energy transfer ratings shall be ARI certified in accordance with the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program, based on ARI Standard 1060-2000.

Fan Wheel: Wheel shall be SWSI centrifugal forward curved type, constructed of painted steel. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

Motors: Motors shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase and enclosure.

Controls and Electrical: All internal electrical components shall be pre-wired for single point power connection. Optional UL Listed control panel. Unit will include hinged access door and interlocking NEMA 3R disconnect switch.

Product: Ventilator shall be model ERV as manufactured by Loren Cook Company of Springfield, Missouri.

ERV - Direct Drive Dimension Data

Size	A	B	C	Wheel Diameter	Filter Quantity/ Filter Size	Approx. Ship. Wt.
500	23-13/16	22	50-3/32	18	(2) - 16 x 20	285
1000	28-13/16	28-1/4	50-3/32	24	(2) - 16 x 25	344

All dimensions in inches. *Weight in pounds, less motor.

Energy Recovery Ventilator Belt Drive

Description: Unit shall be a belt driven energy recovery ventilator.

Certifications: Unit shall be manufactured at an ISO 9001 certified facility. Unit shall be listed by Underwriters Laboratories (UL 1812) and UL listed for Canada (cUL 1812). Unit shall be ARI certified in accordance with the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program. Unit shall bear the AMCA Certified Ratings Seal for Air Performance.

Construction: The unit shall be of bolted construction utilizing corrosion resistant fasteners. Housing shall be minimum 18 gauge galvanized steel, bolted to a minimum 16 gauge galvanized steel base with integral lifting lugs. Unit shall be provided with insulated top, side and interior panels utilizing 1" thick, three pound density foil faced insulation, manufactured and tested to meet NFPA 90A and UL 181 requirements. Insulation shall be fastened to the panels with weatherproof adhesive and weld pins. Energy recovery wheel shall be mounted in a slide track for easy inspection and cleaning. Separate blower and motor shall be provided for supply and exhaust airstream for independent system balancing. Blower and motor assemblies shall be mounted on rubber vibration isolators. Two inch thick, 30 percent efficient pleated filters shall be provided for supply and exhaust airstreams. Removable side panels shall be provided for easy access to motors, blowers, filters and energy recovery wheel. Unit shall bear an engraved aluminum nameplate and shall be shipped in ISTA Certified Transit Tested Packaging.

Energy Wheel: Wheel shall be a total energy recovery wheel constructed of fluted synthetic fiber-based media impregnated with a non-migrating water selective 4 angstrom molecular sieve desiccant. Wheels with the desiccant applied in a secondary operation will not be accepted. Energy transfer ratings shall be ARI certified in accordance with the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program, based on ARI Standard 1060-2000.

Fan Wheel: Wheel shall be DWDI centrifugal forward curved type, constructed of painted steel. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

Motors: Motors shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase, and enclosure.

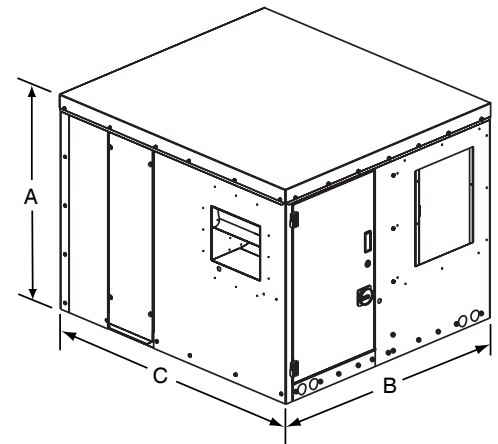
Coils: All heating and cooling coils shall be tested and rated in accordance with ARI Standard 410 and certified in accordance with the ARI Certification Program. DX coils shall be equipped with distributors to receive expansion valves at the liquid connections.

Controls and Electrical: All internal electrical components shall be pre-wired for single point power connection. Internal control panel shall be UL listed with hinged access door and interlocking NEMA 3R disconnect switch. Each motor shall have a motor starter combination providing fuseless disconnect, over-current, overload and motor starting functions. A 24 volt control circuit shall be provided to allow remote on/off control of ERV by building control system. Short circuit protection shall be provided on primary and secondary of control power transformer.

Bearings: Bearings shall be permanently lubricated, sealed ball type selected for a minimum L50 life in excess of 200,000 hours at maximum cataloged operating speed.

Belts and Drives: Belts shall be oil and heat resistant, non-static type. Drives shall be precision machined cast iron type, keyed and securely attached to the wheel and motor shafts. Drives shall be sized for 150 percent of the installed motor horsepower. The variable pitch motor drive shall be factory set to the specified fan RPM.

Product: Ventilator shall be model ERV as manufactured by Loren Cook Company of Springfield, Missouri.



Energy recovery component rated in accordance with ARI Standard 1060-2000 and certified to ARI. Actual performance in packaged equipment may vary.



Loren Cook Company certifies that the ERV shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.



Type ERV is furnished standard with UL 1812 listing (Ducted Heat Recovery Ventilators) when furnished with factory supplied motor.



Type ERV is furnished standard with cUL 1812 listing (Ducted Heat Recovery Ventilators) when furnished with factory supplied motor.

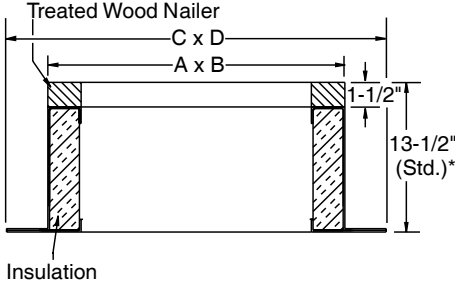
ERV - Belt Drive Dimension Data

Size	A	B	C		Wheel Diameter	Filter Quantity/ Filter Size	Roof Curb Dimensions		Approx. Ship. Wt.
			Standard	with Coils			Standard	with Coils	
1500	42-7/8	49-1/4	54-1/4	90-1/4	28	(2) - 12 x 24, (2) - 20 x 24	45-3/4 x 50-3/4	45-3/4 x 86-3/4	604
2500	52-3/8	52	52	88	36	(4) - 20 x 25	48-1/2 x 48-1/2	48-1/2 x 84-1/2	722
3500	59	60-1/2	64-1/2	100-1/2	42	(4) - 14 x 25, (4) - 16 x 25	57 x 61	57 x 97	990
4500	64-1/2	66-1/2	69-1/2	105-1/2	48	(10) - 16 x 20	63 x 66	63 x 102	1111
5500	71	66-1/2	69-1/2	105-1/2	54	(12) - 16 x 20	63 x 66	63 x 102	1235
7000	76-1/2	80	79-1/2	115-1/2	60	(4) 20 x 20, (8) 20 x 24	76-1/2 x 76	76-1/2 x 112	1609
8500	83	80	79-1/2	115-1/2	66	(6) - 18 x 24, (6) - 20 x 24	76-1/2 x 76	76-1/2 x 112	1734
10000	90	84-1/2	100	136	72	(8) - 20 x 24, (8) - 18 x 20	81 x 96	81 x 132	3000

All dimensions in inches. Weight in pounds, less motor and accessories.

ERV Accessories

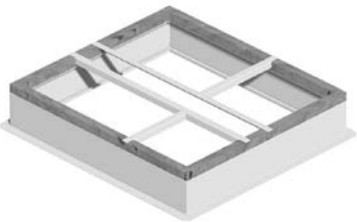
Roof Curbs



*Other heights available.

Size					Coil Section Dimensions	
	A	B	C	D	B	D
1500	45-3/4	50-3/4	49-3/4	54-3/4	86-3/4	90-3/4
2500	48-1/2	48-1/2	52-1/2	52-1/2	84-1/2	88-1/2
3500	57	61	61	65	97	101
4500	63	66	67	70	102	106
5500	63	66	67	70	102	106
7000	76-1/2	76	80-1/2	80	112	116
8500	76-1/2	76	80-1/2	80	112	116
10000	81	96	85	100	132	136

Duct Adapter



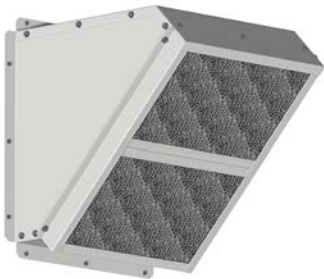
Duct Adapters are available for ERV's in Arrangement V or C. Adapters allow for proper placement and attachment of ductwork prior to unit installation.

Duct Flanges



Duct Flanges are available for easy attachment of ductwork. Flanges are standard on all direct drive units and optional on belt drive units.

Intake Weather Hood



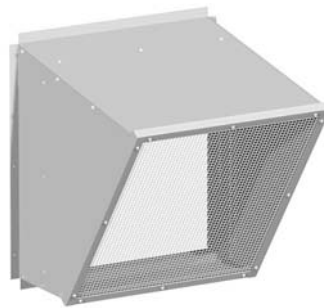
Optional Intake Weather Hood is available for outdoor installations. Hood is provided with 2" thick washable aluminum filters. See page 19 for pressure drop.

Tiered Intake Weather Hood



Optional Tiered Intake Weather Hood is available for outdoor installations. Hood is provided with 2" thick washable aluminum filters mounted in a V-bank style configuration with an easily removable access door. See page 19 for pressure drop.

Exhaust Weather Hood



Optional Exhaust Weather Hood is available for outdoor installations. Hood is provided with bird-screen and available with optional automatic or motorized discharge shutters.

Lorenized® Finish



Optional Lorenized® Finish is available for the exterior surfaces of the ERV. See page 19 for Lorenized™ powder coat specifications.

Dampers

Internal Factory Installed

Gravity and motorized dampers are available factory installed in the supply and exhaust airstreams. Low leakage and insulated dampers are also available. All damper motor actuators are prewired to the unit control panel.

External Duct Mounted

Gravity and motorized dampers are available for field mounting in the supply and exhaust ductwork. Dampers will ship loose and motorized damper actuators will require field wiring.

COIL PRESSURE DROP

Unit Size	CFM	Velocity (FPM)	COOLING COIL Max Air PD in W.G.	HEATING COIL Max Air PD in W.G.
ERV-1500	500	160	0.11	0.03
	750	240	0.2	0.05
	1000	320	0.32	0.08
	1250	400	0.46	0.11
	1500	480	0.62	0.15
ERV-2500	900	195	0.15	0.04
	1300	281	0.26	0.06
	1700	368	0.41	0.1
	2100	455	0.57	0.14
	2500	541	0.75	0.18
ERV-3500	1300	198	0.15	0.04
	1850	282	0.26	0.06
	2400	366	0.4	0.1
	2950	450	0.56	0.13
	3500	533	0.73	0.17
ERV-4500	1500	180	0.13	0.03
	2250	270	0.25	0.06
	3000	360	0.39	0.09
	3750	450	0.56	0.12
	4500	540	0.75	0.16
ERV-5500	2400	263	0.24	0.05
	3175	346	0.37	0.08
	3950	431	0.52	0.12
	4725	515	0.7	0.15
	5500	600	0.89	0.2
ERV-7000	2300	181	0.13	0.03
	3475	273	0.25	0.06
	4650	366	0.4	0.09
	5825	458	0.58	0.13
	7000	551	0.77	0.17
ERV-8500	3100	209	0.16	0.04
	4450	300	0.29	0.07
	5800	391	0.45	0.11
	7150	483	0.62	0.15
	8500	573	0.82	0.2
ERV-10000	3400	198	0.15	0.04
	5050	294	0.28	0.07
	6700	390	0.44	0.11
	8350	486	0.63	0.15
	10000	582	0.84	0.2

Values for pressure drop were obtained using the following assumptions:

1. Six row cooling coil and two row heating coil.
2. A fin style that provides a medium efficiency heat transfer rate with lower air pressure drop and lower fan BHP requirements.

COIL OPTIONS:

Coil options include cooling coils and heating coils. All coils have a casing constructed of galvanized steel with a minimum material thickness of 0.06". The coil tubing is seamless copper with a minimum of 0.016" wall thickness and aluminum plate fin material thickness a minimum of 0.006" with 12 FPI or less. All coils have a recessed vent and drain located on exterior connections.

COOLING COILS:

Cooling coils are available 2, 4, or 6 rows deep. All cooling coils are provided with a stainless steel drain pan and condensate drain pipe that extends out through the side of the unit to allow connection to a P-Trap (by others).

Cooling coils in the ERV-4500 and larger include an upper drain pan with a drainage pipe that drains into the lower pan.

DX COILS:

DX coils are provided with distributors to receive expansion valves at the liquid connections. An access door is provided to allow liquid line connections to be made in the interior of the unit.

HOT WATER COILS:

Hot water coils are available 1 or 2 rows deep.

ELECTRIC HEAT COILS:

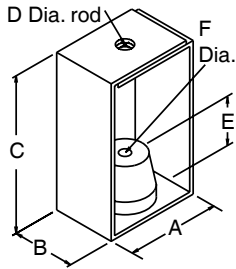
Electric heat coils are available and include the following features: UL Listed, multiple stage control, air proving switch, 24 volt control circuit, fusing when over 48 amps. Heater shall require a separate power connection from the ERV control panel.

ELECTRIC POST-HEATERS AVAILABLE (KW)

Unit Size	Single Phase			Three Phase		
	115v	208v	230v	208	230	460
ERV-1500	C/F	C/F	C/F	4.5, 9	5, 10	5, 10
ERV-2500	C/F	C/F	C/F	9, 13.6	10, 15	10, 15
ERV-3500	C/F	C/F	C/F	13.6, 22.6	15, 25	15, 25
ERV-4500	C/F	C/F	C/F	13.6, 27.1	15, 30	15, 30
ERV-5500	C/F	C/F	C/F	18.1, 31.7	20, 35	20, 35
ERV-7000	C/F	C/F	C/F	22.6, 40.7	25, 45	25, 45
ERV-8500	C/F	C/F	C/F	27.1, 36.2	30, 55	30, 55
ERV-10000	C/F	C/F	C/F	27.1, 58.8	30, 65	30, 65

ERV Accessories

Rubber-in-Shear Isolators - Ceiling Mounted



Isolator Model	Rated Load Each (lbs.)	A	B	C	D	E	F	Approx. Ship Wt. Lbs.
RC-75	75	2-5/32	1-1/2	2-23/32	11/16	15/32	3/8	1
RC-125	125	2-5/32	1-1/2	2-23/32	11/16	15/32	3/8	1
RC-175	175	3-5/32	2-1/4	5-11/16	3/4	1-31/64	3/4	2
RC-300	300	3-5/32	2-1/4	5-11/16	3/4	1-31/64	3/4	2
RC-450	450	3-5/32	2-1/4	5-11/16	3/4	1-31/64	3/4	2
RC-700	700	4	4-3/4	8	3/4	1-1/2	3/4	3
RC-1100	1100	4	4-3/4	8	3/4	1-1/2	3/4	5

All dimensions in inches.

Fan Speed Control - Direct Drive



230 V (5 AMP) 115 V (10 AMP)

Cook's Fan Speed Control (FSC) is a variable speed controller which allows operation of direct drive ERV units from 100 percent of capacity down to approximately 50 percent. The FSC can offer excellent energy conservation and lower sound levels when 100 percent operation is not required. The FSC employs solid state circuitry for long-life and dependability and is available only on direct drive models. The FSC is normally shipped loose for field installation and optional pre-wiring is available.

Variable Speed - Belt Drive

Two-speed Motors - consult factory.

Variable Frequency Drives - consult factory.

Typical Disconnect Switches

Standard
Factory Installed



NEMA 3R/12

Optional Field Installed



NEMA 1



NEMA 1
(Lockable)



NEMA 1
(Heavy)



NEMA 3R



NEMA 4

NEMA 3R/12 - Standard factory installed padlockable for indoor or outdoor use

NEMA 1 - Indoor general purpose

NEMA 1 - Indoor general purpose with locking capability

NEMA 1 - Indoor heavy duty with locking capability and visible blade

NEMA 3R - Rain-tight

NEMA 4 - Water-tight and dust-tight

Motors

Belt Drive Units

- Single phase ODP motors are available from 1/6 to 1-1/2 HP
- Three phase ODP motors are available from 1/4 to 10 HP
- Single phase TEFC motors are available from 1/6 to 1 HP
- Three phase TEFC motors are available from 1/4 to 10 HP

Other Accessories:

- **Hinged Access Doors** - Standard on sizes 500 and 1000, available on sizes 1500 through 10000.
- **Quarter Turn Latches** - Available on hinged access doors only.
- **Double Wall Construction** - Unit is lined with 20 gauge galvanized steel.
- **Sensible Only Wheels** - Desiccant free wheel media for sensible only heat transfer.
- **Purge Section** - Allows contaminated air to be purged from within the wheel flutes and diverted back into the exhaust airstream. The addition of a purge section will slightly increase cfm requirements. For more information refer to ERV selection included in Compute-A-Fan selection software.

Control Options

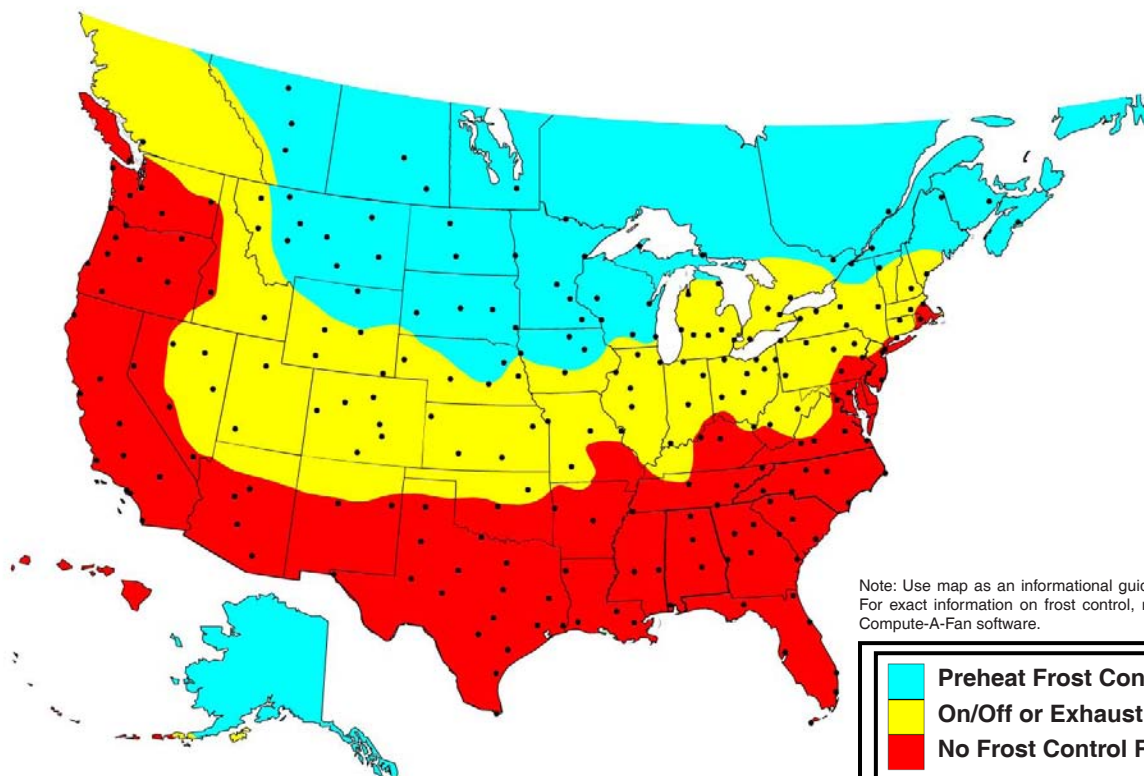
- **Dirty Filter Sensor** - Senses fan compartment pressure change, which actuates a dirty filter warning light. Sensor requires field calibration after initial system start-up.
- **Rotation Sensor** - If wheel rotation stops the sensor sends a 24 volt signal to a remote indicator (by others).
- **Economizer Mode** - Stops wheel rotation during periods when outdoor air conditions are close enough to indoor air conditions that sensible and latent heat transfer no longer occurs. Available with a temperature sensor or an enthalpy sensor. (The enthalpy sensor senses temperature and humidity conditions)
- **Economizer Automatic Override Sensor** - Temperature sensor provides automatic override of economizer mode during the winter heating season when energy recovery is required. Economizer manual override can also be set up with a manual override switch, by wiring a remote switch to the energy recovery wheel terminal block.
- **Remote Panels** are available in many different custom combinations of status indicator lights, manual switches, and automatic programmable controls. All remote panels come complete with a custom stainless steel wall plate and a junction box. The remote panel requires field wiring connections to the low voltage terminal block located in the ERV control panel.
- **Status Indicator Lights** are available for rotation sensor, dirty filter sensors, economizer mode and frost control on/off.
- **Two-Way Switches** are available for remote on/off, and economizer override.
- **Three-Way Switches** are available for selecting on, off, or automatic operation of the ERV. For units supplied with two-speed motors, three-way switches are available for selecting high speed, low speed, or unit off.
- **7-Day Time Clocks** are available and feature easy programming for automatic control of ERV operation.
- **Manual Timed Override Switches** are available for manual override of 7-day time clocks with an adjustable on time setting of up to two hours.
- **Frost Control Options**
 - **On/Off Frost Control** - When the outside air is below a preset temperature the controller shuts off the entire unit. The unit will automatically restart when the outdoor air temperature climbs above the set point.
 - **Exhaust Only Frost Control** - When the outside air is below a preset temperature the controller shuts off the supply side blower until the temperature climbs above the set point.
 - **Timed Exhaust Frost Control** - When the temperature measured is below the thermostat adjustable temperature setting, the thermostat shuts off the supply side blower motor and engages an on/off recycling timer with independent adjustment of both the on and off periods (1-100 minutes). The supply side blower then turns on and off based on timer settings. When the temperature measured climbs above the set point temperature, then the supply side blower motor returns to continuous operation.
 - **Pre-Heat Frost Control** - When the outside air is below a preset air temperature an open coil duct heater is energized that preheats the intake air to prevent frost buildup. This option is only available on ERV sizes 1500 through 10000.
 - **Field Installed Duct Heater** - Consult factory for availability and options.
 - **Electric Pre-Heater Sizing** - Once the volume of airflow (CFM) and the required temperature rise (ΔT) through the heater are known, the required kilowatt rating (KW) of the heater can be determined from the formula:

$$KW = (CFM \times \Delta T^{\circ}F) / 3193 \text{ or } (Liters/second \times \Delta T^{\circ}C) / 837$$



Remote Panel

Frost Control Map



Note: Use map as an informational guideline and a quick estimating tool. For exact information on frost control, refer to ERV selection included in Compute-A-Fan software.

- | | |
|---------------------------------------|--------------------------------------|
| ■ | Preheat Frost Control |
| ■ | On/Off or Exhaust Only Frost Control |
| ■ | No Frost Control Required |

ERV Electrical Requirements

Motors

Supply and Exhaust Blower Motors (2 per unit)

Model	115V, 1 Phase	230V, 1 Phase	230/460V, 3 Phase
ERV-500	1/2 HP	1/2 HP	-
ERV-1000	1 HP	1 HP	-
ERV-1500	1/6 HP to 1 HP	1/6 HP to 1-1/2 HP	1/4 HP to 1-1/2 HP
ERV-2500	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 3 HP
ERV-3500	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 3 HP
ERV-4500	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 5 HP
ERV-5500	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 5 HP
ERV-7000	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 7-1/2 HP
ERV-8500	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 7-1/2 HP
ERV-10000	1/6 HP to 1 HP	1/6 HP to 3 HP	1/4 HP to 10 HP

Voltage and phase of exhaust and supply blower motors must be the same. Horsepower of supply and exhaust blowers can vary.

Single Phase Alternating-Current Motors (Table 1)

HP	Motor Full Load Amperage		
	115V	208V	230V
1/6	4.0	2.2	2.0
1/4	5.0	2.8	2.5
1/3	7.0	3.9	3.5
1/2	9.0	5.0	4.5
3/4	11.8	6.5	5.9
1	12.8	7.1	6.4
1-1/2	18.0	10.0	9.0
2	20.4	11.3	10.2
3	-	13.9	12.6

Three Phase Alternating-Current Motors (Table 2)

HP	Motor Full Load Amperage		
	208V	230V	460V
1/2	2.7	2.4	1.2
3/4	3.1	2.8	1.4
1	4.0	3.6	1.8
1-1/2	5.5	5.0	2.5
2	7.3	6.6	3.3
3	10.0	9.0	4.5
5	15.5	14.0	7.0
7-1/2	23.9	21.6	10.8
10	31.6	28.6	14.3

Values taken from typical motors and are approximate. Use only for preliminary estimates. For exact values consult motor nameplate and local codes.

Energy Wheel Motors (1 per unit) (Table 3)

Model	RPM	HP	Motor Full Load Amperage					
			1 Phase			3 Phase		
			115	208	230	208	230	460
500-1500	585	1/15	2.0	1.1	1.0	-	-	-
2500-5500	1140	1/3	7.0	3.9	3.5	2.4	2.2	1.1
7000-8500	1140	1/2	9.0	5.0	4.5	2.7	2.4	1.2
10000	1140	3/4	11.8	6.5	5.9	3.1	2.8	1.4

All energy wheel motors are end mount. Single phase motors include thermal protection. For three phase motors, thermal overload protection is provided on the control panel.

Electric Pre-Heaters Available (KW)

Model	Single Phase			Three Phase		
	115V	208V	230V	208V	230V	460V
† ERV-500	1.0	0.9	1.0	-	-	-
† ERV-1000	2.0	1.8	2.0	-	-	-
ERV-1500	-	-	-	4.5, 8.1	5.0, 9.0, 12.0	5.0, 9.0, 12.0
ERV-2500	-	-	-	4.5, 9.0, 13.6	5.0, 10.0, 15.0	5.0, 10.0, 15.0
ERV-3500	-	-	-	4.5, 9.0, 13.6	5.0, 10.0, 15.0	5.0, 10.0, 15.0
ERV-4500	-	-	-	6.8, 13.6	7.5, 15.0	7.5, 15.0, 22.5
ERV-5500	-	-	-	9.0, 13.6	10.0, 15.0	10.0, 20.0, 25.0
ERV-7000	-	-	-	9.0, 13.6	10.0, 15.0	10.0, 20.0, 25.0, 30.0
ERV-8500	-	-	-	13.6	15.0	15.0, 25.0, 30.0, 40.0
ERV-10000	-	-	-	-	-	15.0, 25.0, 30.0, 40.0, 45.0

† KW values for ERV-500 and ERV-1000 are for field installed duct heaters only and should not be added to the full load amperage of the ERV unit.

Minimum Circuit Amperage (MCA) Worksheet

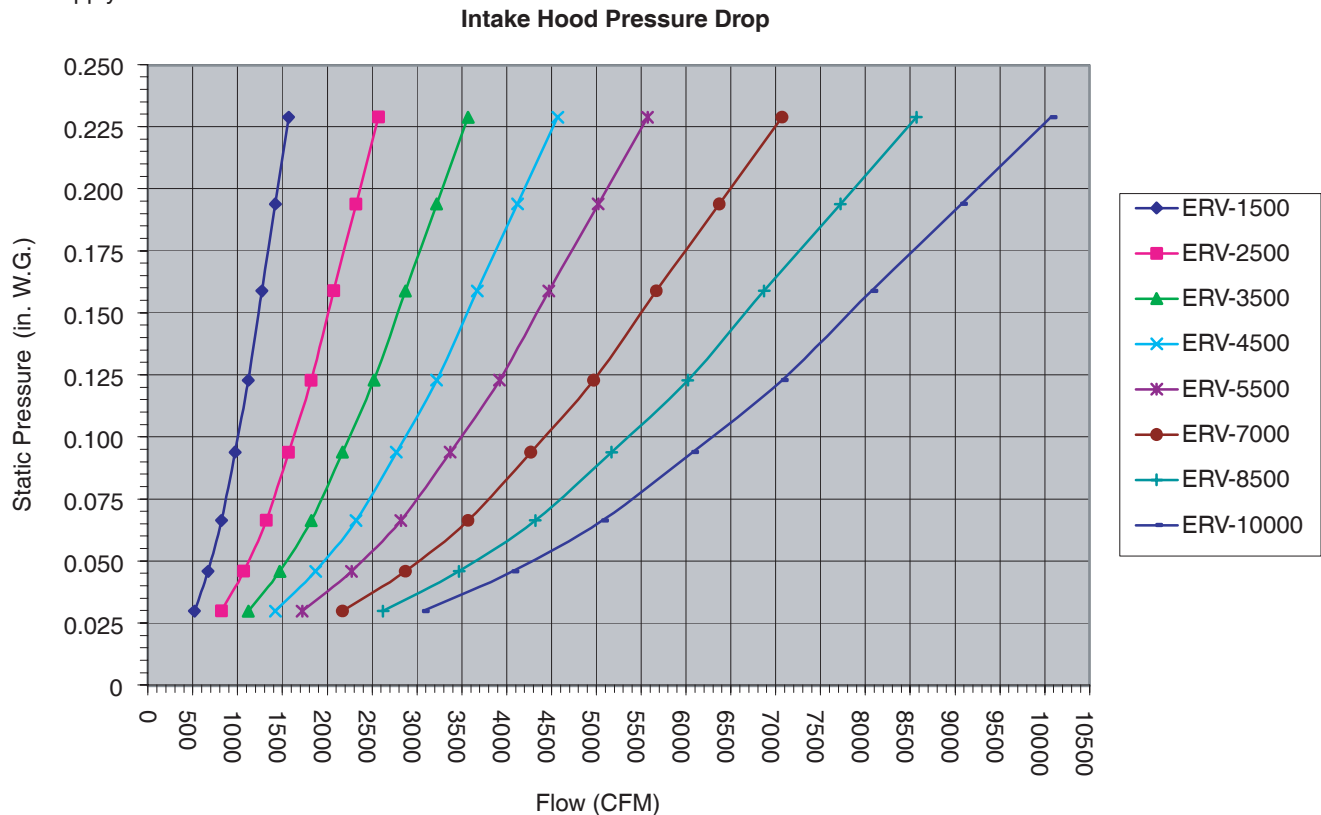
Supply motor amperage (see table 1 or 2 above)
 Exhaust motor amperage (see table 1 or 2 above)
 Energy wheel motor amperage (see table 3 above)
 Control component amperage (115v = .86 amps, 208v = .48 amps, 230v = .43 amps, 460v = .22 amps)
 + Heater amperage (see table 3 for KW): 1 phase: amperage = $\frac{\text{KW} \times 1000}{\text{heater voltage}}$ 3 phase: amperage = $\frac{\text{KW} \times 1000}{\text{unit voltage} \times 1.732}$
 Total Unit Amperage
 x 1.25 Service Factor
 Minimum Circuit Amperage

Maximum Overload Circuit Protection (MOCP) Calculation

To obtain the MOCP of the ERV, take the Total Unit Amperage of the ERV (also used to calculate the MCA). Then, take the FLA of the largest motor on the ERV X 1.25 and add it to the Total Unit Amperage. Take the resulting number and round it down to the nearest available circuit protector. For instance, if the Total Unit Amperage is 22, and the largest motor is a 1 horsepower 3 phase 208 volt (4 X 1.25=5), then 22+5=27. Compare this number to a list of available circuit protectors. A 25 amp protector is available, therefore, the MOCP=25.

Intake Hood Pressure Drop

Use this chart to determine the pressure drop of the optional intake hood. The value should be added to the external static pressure for the supply air stream.



Lorenized™ Fan Finish Specification (Optional)

All steel fan components shall be finished with an electrostatically applied, baked polyester powder coating. Each component shall be subject to a five stage environmentally friendly wash system, followed by a minimum 2 mil thick baked powder finish. Paint must exceed 1,000 hour salt spray under ASTM B117 test method.

Standard Color - Gray

Final Coat Thickness - Minimum 2 mils

Polyester Powder Testing Information

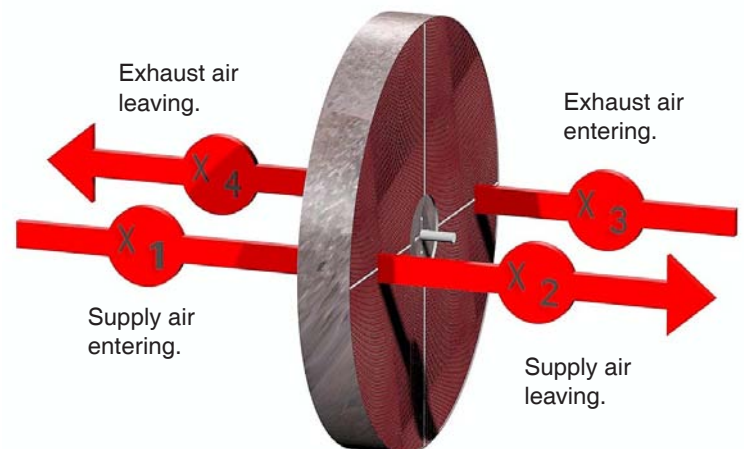
Impact Resistance	Test - ASTM D2794	Value - 100 inch-pounds
Pencil Hardness	Test - ASTM D3363	Value - 2H (Mar or Gouge)
Crosshatch Adhesion	Test - ASTM D3359 Method B	Value - 100%
Humidity Resistance	Test - ASTM D2247	Value - 1000+ Hours
Salt Spray	Test - ASTM B117	Value - 1000+ Hours
Continuous Service Temperature	Test - N/A	Value - 230°F (110°C)

Air Performance Notes

Air tests were performed with 30 percent efficient filters installed in both the exhaust and supply airstreams. Air performance data includes the initial pressure drop of the air filters. Supply air tests were performed at station X₂ with stations X₁, X₃, and X₄ at 0" S.P. (in. W.G.). Exhaust air tests were performed at station X₃ with stations X₁, X₂, and X₄ at 0" S.P. (in. W.G.). Performance tables show external static pressure values only.

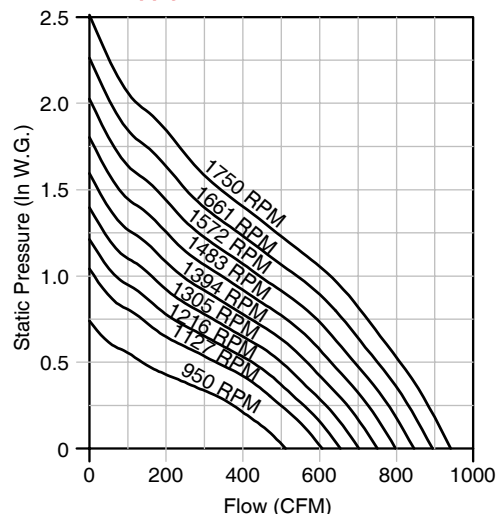
Energy Wheel Performance Notes

Energy transfer ratings are ARI certified in accordance with the ARI *Air-to-Air Energy Recovery Ventilation Equipment Certification Program*, based on ARI Standard 1060-2000 and ASHRAE 84-1991. Published effectiveness ratings correspond to total energy transfer. Sensible only effectiveness will be higher.

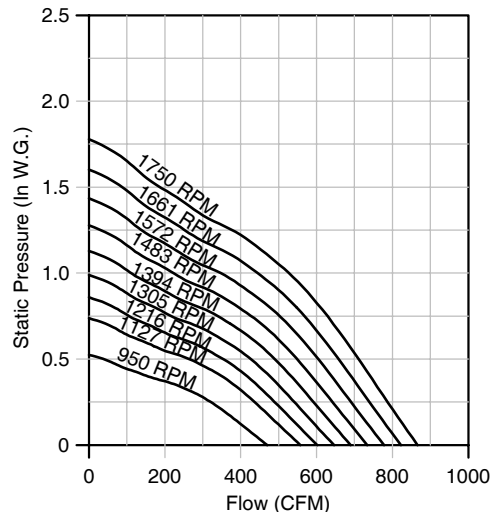


ERV - 500 Data

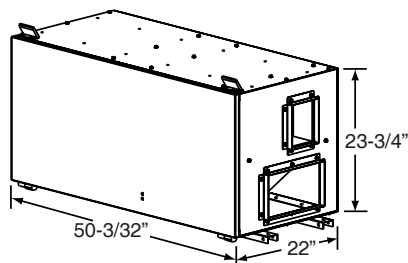
ERV - 500 Supply



ERV - 500 Exhaust



Energy Recovery Wheel Diameter - 18"
 Direct Drive
 Maximum MHP - 1/2
 Maximum Input Watts: 520 - Supply
 566 - Exhaust
 Cabinet - 18 ga. steel
 Shipping Weight - 285 lbs.



ERV - 500 Supply

Catalog Number	RPM	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP	
		CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF
ERV-500	950	453	73%	375	76%	259	82%	138	89%								
	1000	484	71%	411	75%	313	79%	187	86%								
	1050	514	70%	446	73%	365	77%	246	83%	57	94%						
	1100	544	68%	481	71%	409	75%	302	80%	113	90%						
	1150	574	67%	515	70%	449	73%	357	77%	157	88%						
	1200	603	66%	548	68%	486	71%	409	75%	202	85%	57	94%				
	1250	632	65%	581	67%	521	69%	455	72%	258	82%	106	91%				
	1300	660	64%	613	65%	556	68%	497	71%	317	79%	158	88%				
	1350	689	62%	645	64%	591	66%	535	69%	373	76%	201	85%	69	93%		
	1400	717	61%	676	63%	625	65%	571	67%	427	74%	249	83%	122	90%		
	1450	745	60%	706	62%	658	64%	607	66%	481	71%	306	80%	174	87%	56	94%
	1500	774	59%	737	60%	692	62%	641	64%	530	69%	365	77%	216	84%	93	91%
	1550	802	58%	766	59%	724	61%	676	63%	574	67%	421	74%	262	82%	153	88%
	1600	830	57%	796	58%	756	60%	710	61%	615	65%	475	72%	317	79%	200	85%
	1650	857	56%	825	57%	788	58%	744	60%	653	64%	530	69%	376	76%	243	83%
	1700	885	55%	854	56%	819	57%	777	59%	689	62%	582	67%	434	73%	289	81%
	1750	913	54%	883	55%	849	56%	810	58%	725	61%	628	65%	489	71%	344	78%

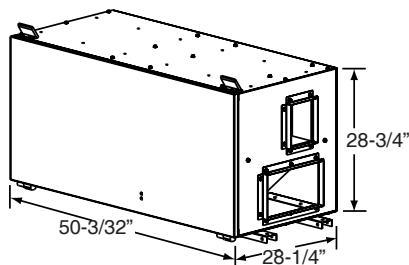
Speed (RPM) is nominal. Performance is based on actual speed of test. Performance for speeds shown are obtained with an FSC. Gross supply air performance ratings (air flow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Performance ratings include the effects of filters in the airstream.

ERV - 500 Exhaust

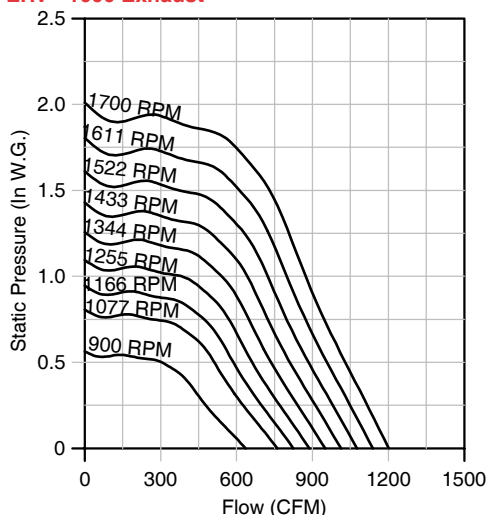
Catalog Number	RPM	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP	
		CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF
ERV-500	950	393	75%	320	79%	205	85%	58	93%								
	1000	421	74%	353	77%	259	82%	113	90%								
	1050	448	73%	385	76%	305	80%	172	87%								
	1100	475	72%	416	74%	346	78%	241	83%								
	1150	502	70%	446	73%	382	76%	294	80%	57	94%						
	1200	529	69%	475	72%	416	74%	341	78%	107	91%						
	1250	555	68%	504	70%	449	73%	384	76%	171	87%						
	1300	581	67%	532	69%	480	71%	421	74%	228	84%						
	1350	608	66%	560	68%	511	70%	457	72%	299	80%	89	92%				
	1400	634	65%	588	67%	541	69%	490	71%	352	77%	141	89%				
	1450	660	64%	615	65%	570	67%	522	69%	400	75%	205	85%				
	1500	685	62%	642	64%	599	66%	554	68%	444	73%	262	82%	90	92%		
	1550	711	61%	669	63%	628	65%	585	67%	485	71%	333	78%	140	89%		
	1600	737	60%	696	62%	656	64%	615	65%	522	69%	390	76%	204	85%	42	94%
	1650	762	59%	723	61%	684	63%	644	64%	557	68%	439	73%	261	82%	106	91%
	1700	788	58%	749	60%	712	61%	673	63%	591	66%	485	71%	324	79%	155	88%
	1750	813	58%	776	59%	739	60%	702	62%	623	65%	528	69%	394	75%	220	84%

Speed (RPM) is nominal. Performance is based on actual speed of test. Performance for speeds shown are obtained with an FSC. Gross exhaust air performance ratings (air flow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Performance ratings include the effects of filters in the airstream.

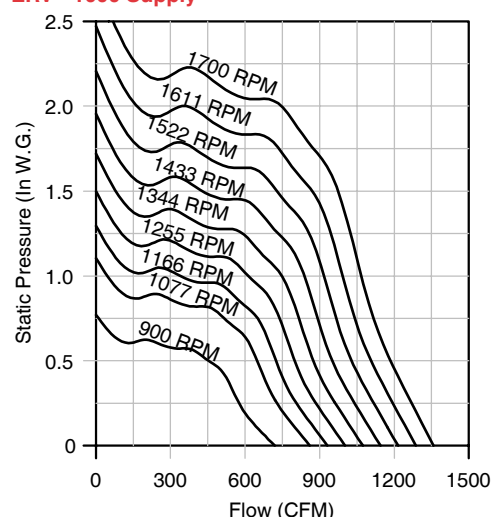
Energy Recovery Wheel Diameter - 24"
Direct Drive
Maximum MHP - 1
Maximum Input Watts: 1090 - Supply
1115 - Exhaust
Cabinet - 18 ga. steel
Shipping Weight - 344 lbs.



ERV - 1000 Exhaust



ERV - 1000 Supply



ERV - 1000 Supply

Catalog Number	RPM	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP	
		CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF
ERV-1000	900	637	77%	576	79%	534	80%	454	83%								
	950	681	76%	618	78%	577	79%	529	80%								
	1000	725	75%	661	77%	620	78%	580	79%								
	1050	768	74%	705	76%	662	77%	626	78%	475	82%						
	1100	811	73%	748	74%	704	76%	669	77%	552	80%						
	1150	854	72%	792	73%	746	75%	711	75%	631	78%						
	1200	896	71%	837	72%	788	73%	754	74%	687	76%						
	1250	939	70%	881	71%	832	72%	795	73%	734	75%	606	78%				
	1300	981	69%	925	70%	875	71%	837	72%	779	74%	687	76%				
	1350	1023	68%	969	69%	919	70%	880	71%	822	73%	755	74%	603	78%		
	1400	1065	67%	1012	68%	963	69%	923	70%	864	71%	807	73%	681	76%		
	1450	1107	66%	1056	67%	1007	68%	966	69%	906	70%	854	72%	763	74%		
	1500	1148	65%	1099	66%	1051	67%	1010	68%	948	69%	898	71%	833	72%	696	76%
	1550	1190	64%	1142	65%	1096	66%	1053	67%	990	68%	941	70%	887	71%	772	74%
	1600	1231	63%	1185	64%	1140	65%	1097	66%	1032	67%	984	69%	935	70%	854	72%
	1650	1273	62%	1228	63%	1184	64%	1141	65%	1075	66%	1026	68%	981	69%	921	70%
	1700	1314	61%	1270	62%	1227	63%	1186	64%	1117	65%	1068	67%	1024	68%	974	69%

Speed (RPM) is nominal. Performance is based on actual speed of test. Performance for speeds shown are obtained with an FSC. Gross supply air performance ratings (air-flow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Performance ratings include the effects of filters in the airstream.

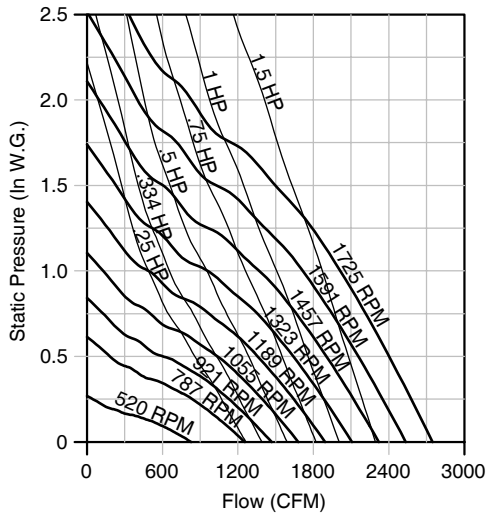
ERV - 1000 Exhaust

Catalog Number	RPM	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP	
		CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF	CFM	EFF
ERV-1000	900	555	80%	482	82%	425	83%	338	86%								
	950	594	79%	523	81%	467	82%	406	84%								
	1000	633	78%	564	79%	507	81%	457	83%								
	1050	671	77%	605	78%	548	80%	500	81%	312	87%						
	1100	709	76%	646	77%	589	79%	541	80%	411	84%						
	1150	747	74%	686	76%	630	78%	582	79%	481	82%						
	1200	784	74%	727	75%	671	77%	623	78%	536	80%	279	88%				
	1250	821	73%	766	74%	712	75%	664	77%	582	79%	445	83%				
	1300	858	72%	806	73%	753	74%	705	76%	624	78%	518	81%				
	1350	895	71%	845	72%	793	73%	746	75%	665	77%	582	79%	373	85%		
	1400	932	70%	884	71%	834	72%	787	73%	706	76%	633	78%	501	81%		
	1450	968	69%	922	70%	874	71%	827	72%	747	74%	677	76%	574	79%	271	88%
	1500	1005	68%	960	69%	914	70%	868	71%	788	73%	720	75%	640	77%	488	82%
	1550	1041	67%	998	68%	954	69%	909	70%	828	72%	761	74%	693	76%	573	79%
	1600	1077	66%	1036	67%	993	68%	950	69%	869	71%	802	73%	739	75%	645	77%
	1650	1114	65%	1074	66%	1032	67%	990	68%	910	70%	842	72%	782	74%	709	76%
	1700	1150	65%	1111	66%	1071	66%	1030	67%	951	69%	883	71%	824	72%	761	74%

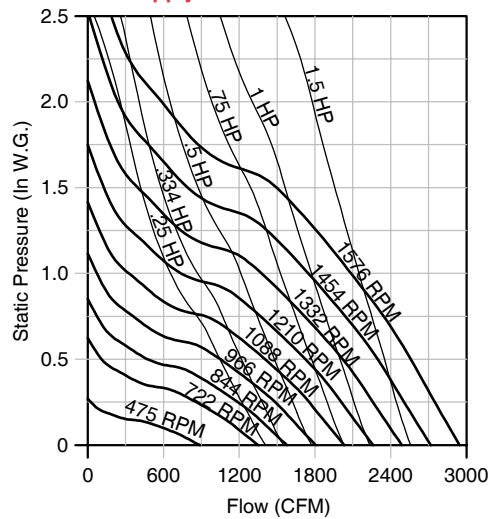
Speed (RPM) is nominal. Performance is based on actual speed of test. Performance for speeds shown are obtained with an FSC. Gross exhaust air performance ratings (air-flow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Performance ratings include the effects of filters in the airstream.

ERV - 1500 Data

ERV - 1500 Exhaust



ERV - 1500 Supply



Energy Recovery Wheel Diameter - 28"

Belt Drive

Maximum RPM - 1725

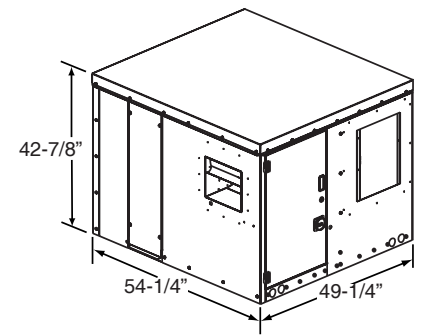
Maximum MHP - 1.5

Maximum Motor Frame - 145T

Housing - 18 ga. steel

Base - 16 ga. steel

Shipping Weight (less motors) - 604 lbs.



ERV - 1500 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
500	594	475	.03	623	.05	749	.07	850	.10	1010	.14	1142	.19	1257	.24	1362	.29	85%
550	654	491	.03	630	.05	756	.08	860	.11	1025	.16	1158	.21	1274	.26	1378	.32	84%
600	713	508	.04	640	.06	762	.09	869	.12	1038	.17	1173	.23	1290	.29	1394	.34	83%
650	773	525	.05	654	.07	768	.09	875	.12	1049	.19	1188	.25	1306	.31	1411	.37	82%
700	832	543	.06	669	.08	776	.10	880	.13	1059	.20	1200	.27	1320	.33	1427	.40	81%
750	892	562	.06	685	.09	788	.12	886	.15	1066	.22	1211	.29	1334	.36	1442	.43	80%
800	951	581	.07	701	.10	802	.13	895	.16	1072	.23	1221	.31	1346	.38	1456	.46	79%
850	1010	600	.09	718	.11	817	.14	906	.17	1077	.24	1229	.33	1357	.41	1468	.49	78%
900	1070	620	.10	736	.13	833	.16	919	.19	1083	.26	1235	.34	1366	.43	1480	.52	77%
950	1129	640	.11	754	.14	849	.18	934	.21	1090	.28	1241	.36	1374	.46	1490	.55	76%
1000	1189	661	.12	772	.16	866	.20	949	.23	1100	.30	1246	.38	1381	.48	1499	.58	75%
1050	1248	683	.14	790	.18	883	.21	965	.25	1112	.32	1252	.41	1386	.50	1506	.60	74%
1100	1308	705	.16	809	.20	900	.24	981	.27	1125	.35	1259	.43	1391	.53	1513	.63	73%
1150	1367	728	.18	828	.22	918	.26	998	.30	1140	.38	1269	.46	1397	.56	1518	.66	72%
1200	1427	751	.20	848	.24	936	.28	1015	.32	1155	.41	1281	.49	1403	.58	1523	.69	71%
1250	1486	774	.22	868	.26	954	.31	1032	.35	1171	.44	1294	.53	1412	.62	1529	.72	70%
1300	1546	798	.24	888	.29	973	.34	1050	.38	1187	.47	1308	.56	1422	.65	1535	.76	69%
1350	1605	821	.27	908	.32	992	.37	1068	.41	1203	.51	1323	.60	1434	.69	1543	.80	68%
1400	1665	846	.30	929	.35	1011	.40	1086	.44	1220	.54	1338	.64	1447	.74	1552	.84	68%
1450	1724	870	.33	950	.38	1031	.43	1105	.48	1237	.58	1354	.68	1462	.78	1564	.88	67%
1500	1784	894	.36	972	.41	1050	.46	1123	.52	1254	.62	1370	.73	1476	.83	1576	.93	66%

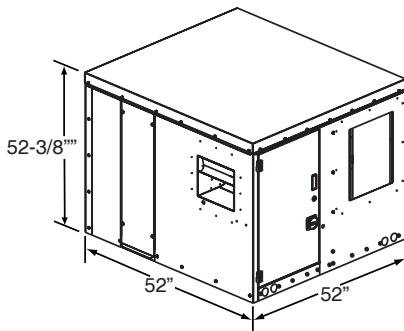
Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 1500 Exhaust

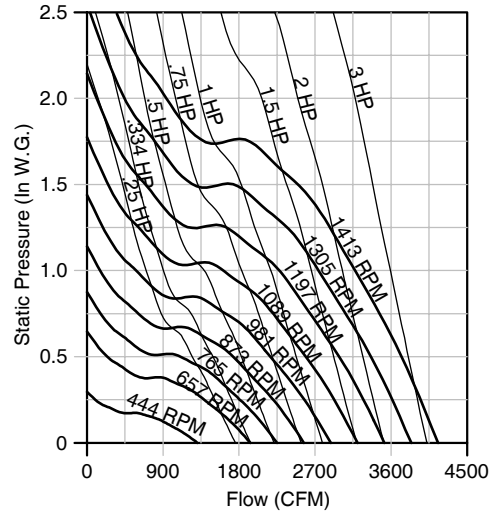
CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
500	594	520	.04	667	.07	793	.10	895	.13	1052	.19	1190	.25	1318	.32	1434	.40	85%
550	654	539	.05	683	.08	801	.11	910	.14	1072	.21	1205	.28	1329	.35	1445	.43	84%
600	713	559	.05	700	.09	813	.12	919	.16	1092	.23	1224	.30	1343	.38	1455	.46	83%
650	773	581	.06	717	.10	828	.13	928	.17	1108	.25	1244	.33	1360	.41	1468	.49	82%
700	832	604	.07	733	.11	845	.15	941	.19	1120	.27	1264	.36	1380	.44	1486	.53	81%
750	892	628	.09	751	.12	862	.16	956	.20	1128	.29	1280	.39	1401	.48	1505	.57	80%
800	951	652	.10	771	.14	879	.18	973	.22	1137	.31	1291	.41	1419	.51	1526	.61	79%
850	1010	676	.12	792	.16	896	.20	990	.25	1150	.34	1300	.44	1434	.55	1545	.65	78%
900	1070	702	.13	814	.17	913	.22	1007	.27	1165	.36	1309	.47	1445	.58	1562	.70	77%
950	1129	727	.15	836	.19	932	.24	1024	.29	1182	.39	1319	.50	1454	.62	1575	.74	76%
1000	1189	753	.17	859	.22	952	.26	1041	.32	1199	.43	1333	.53	1462	.65	1585	.78	75%
1050	1248	780	.19	882	.24	974	.29	1059	.34	1216	.46	1349	.57	1472	.69	1594	.82	74%
1100	1308	807	.22	906	.27	995	.32	1078	.37	1233	.49	1365	.61	1485	.73	1602	.86	73%
1150	1367	834	.24	931	.30	1018	.35	1098	.40	1249	.53	1383	.65	1500	.77	1612	.90	72%
1200	1427	861	.27	956	.33	1041	.38	1119	.44	1266	.57	1400	.70	1516	.82	1625	.95	71%
1250	1486	889	.30	981	.36	1064	.41	1140	.47	1283	.60	1417	.74	1534	.87	1640	1.00	70%
1300	1546	917	.33	1006	.39	1088	.45	1163	.51	1302	.64	1433	.79	1551	.93	1656	1.06	69%
1350	1605	945	.37	1032	.43	1111	.49	1185	.55	1321	.69	1450	.84	1568	.98	1673	1.12	68%
1400	1665	974	.41	1058	.47	1136	.54	1208	.60	1341	.73	1467	.88	1585	1.04	1691	1.19	68%
1450	1724	1003	.45	1084	.51	1160	.58	1232	.65	1362	.78	1484	.94	1601	1.10	1708	1.25	67%
1500	1784	1031	.49	1111	.56	1185	.63	1255	.69	1383	.84	1503	.99	1618	1.16	1725	1.32	66%

Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

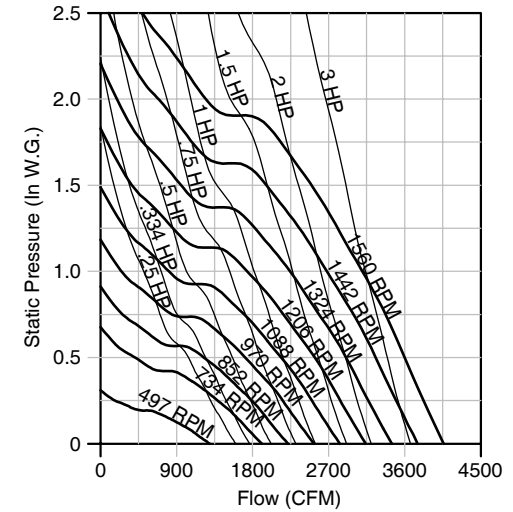
Energy Recovery Wheel Diameter - 36"
Belt Drive
Maximum RPM - 1560
Maximum MHP - 3
Maximum Motor Frame - 145T
Housing - 18 ga. steel
Base - 16 ga. steel
Shipping Weight (less motors) - 722 lbs.



ERV - 2500 Supply



ERV - 2500 Exhaust



ERV - 2500 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	Effectiveness
900	868	444	.06	559	.09	655	.12											84%
1000	964	469	.08	574	.11	668	.14											83%
1100	1060	494	.09	591	.13	684	.17	763	.20									82%
1200	1157	519	.12	612	.15	699	.19	779	.23									80%
1300	1253	546	.14	635	.18	715	.22	794	.27	929	.36							79%
1400	1350	573	.17	660	.21	734	.25	809	.30	943	.40							78%
1500	1446	600	.20	684	.25	756	.29	825	.34	959	.45	1072	.55					77%
1600	1543	629	.24	710	.29	780	.33	844	.38	974	.49	1086	.60					76%
1700	1639	658	.28	735	.33	804	.38	866	.43	989	.55	1102	.67	1202	.78			74%
1800	1736	688	.32	761	.38	829	.43	889	.48	1004	.60	1117	.73	1216	.85	1309	.98	73%
1900	1832	718	.37	788	.43	854	.49	913	.54	1022	.66	1132	.80	1232	.93	1322	1.06	72%
2000	1929	748	.43	815	.49	879	.55	938	.61	1042	.73	1147	.86	1247	1.01	1336	1.15	71%
2100	2025	779	.49	843	.55	905	.62	963	.68	1064	.80	1163	.94	1262	1.09	1352	1.24	70%
2200	2121	811	.56	871	.62	931	.69	988	.76	1088	.89	1181	1.02	1277	1.18	1368	1.34	69%
2300	2218	841	.63	900	.70	958	.77	1013	.84	1112	.98	1201	1.11	1293	1.27	1383	1.44	68%
2400	2314	874	.71	929	.78	985	.85	1039	.93	1136	1.07	1223	1.21	1310	1.37	1398	1.54	67%
2500	2411	906	.80	959	.87	1013	.95	1065	1.02	1161	1.17	1246	1.32	1328	1.47	1413	1.64	66%

Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

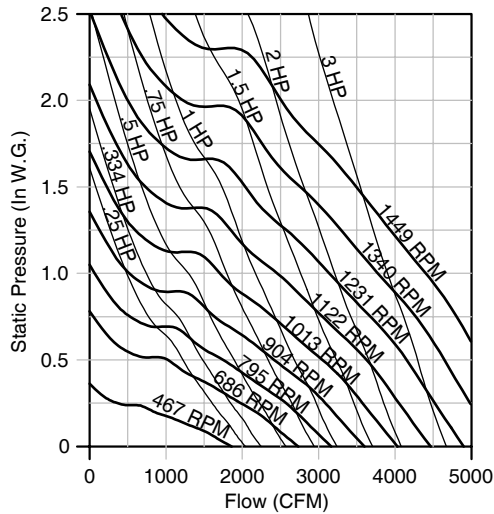
ERV - 2500 Exhaust

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	Effectiveness
900	868	497	.08	610	.12	704	.16											84%
1000	964	524	.11	632	.15	725	.19											83%
1100	1060	553	.13	656	.18	746	.22	825	.27									82%
1200	1157	582	.16	682	.21	769	.26	846	.31									80%
1300	1253	612	.19	710	.25	792	.30	868	.36	1001	.47							79%
1400	1350	644	.23	738	.29	817	.35	891	.41	1022	.53							78%
1500	1446	677	.27	766	.34	844	.40	914	.46	1043	.60	1156	.73					77%
1600	1543	711	.32	794	.39	872	.46	939	.52	1065	.67	1176	.81					76%
1700	1639	745	.38	824	.45	899	.53	966	.60	1088	.74	1198	.89	1297	1.04			74%
1800	1736	780	.44	854	.51	927	.60	993	.67	1111	.82	1220	.98	1317	1.14	1409	1.30	73%
1900	1832	815	.51	885	.59	956	.67	1021	.76	1135	.91	1242	1.08	1339	1.25	1428	1.41	72%
2000	1929	850	.58	918	.67	985	.76	1049	.85	1161	1.01	1264	1.18	1361	1.36	1449	1.54	71%
2100	2025	886	.67	951	.75	1014	.84	1077	.94	1188	1.11	1288	1.29	1383	1.48	1471	1.67	70%
2200	2121	921	.75	984	.85	1045	.94	1105	1.04	1215	1.23	1312	1.40	1405	1.60	1493	1.80	69%
2300	2218	957	.85	1018	.95	1076	1.05	1134	1.15	1243	1.36	1338	1.54	1428	1.73	1515	1.94	68%
2400	2314	993	.96	1053	1.06	1108	1.16	1164	1.27	1271	1.49	1365	1.68	1452	1.87	1537	2.08	67%
2500	2411	1029	1.07	1087	1.18	1141	1.29	1194	1.40	1299	1.63	1392	1.83	1478	2.03	1560	2.24	66%

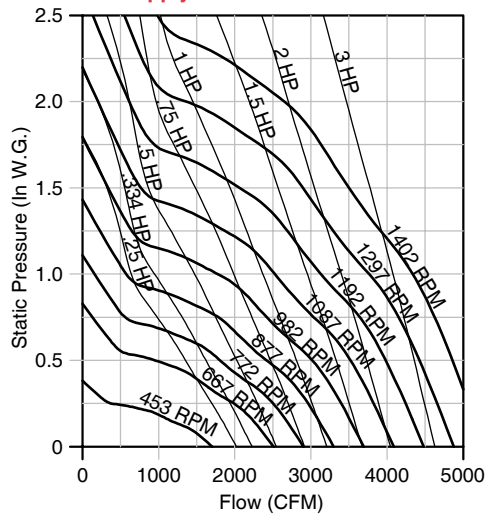
Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 3500 Data

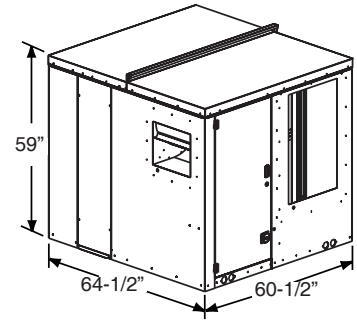
ERV - 3500 Exhaust



ERV - 3500 Supply



Energy Recovery Wheel Diameter - 42"
Belt Drive
Maximum RPM - 1449
Maximum MHP - 3
Maximum Motor Frame - 184T
Housing - 18 ga. steel
Base - 14 ga. steel
Shipping Weight (less motors) - 990 lbs.



ERV - 3500 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
1300	891	453	.10	550	.15	625	.19	698	.24	828	.33	938	.44	1038	.55	1129	.67	84%
1400	960	470	.12	567	.17	640	.22	709	.26	837	.36	947	.47	1045	.59	1135	.71	83%
1500	1028	489	.15	585	.19	657	.24	722	.29	846	.40	956	.51	1053	.63	1142	.76	82%
1600	1097	509	.17	602	.22	675	.27	737	.33	856	.44	965	.55	1062	.68	1150	.81	81%
1700	1165	530	.20	618	.25	692	.31	753	.36	866	.48	974	.60	1071	.73	1158	.86	80%
1800	1234	552	.23	635	.28	709	.34	771	.40	879	.52	983	.65	1080	.78	1167	.92	79%
1900	1303	575	.26	651	.32	727	.38	788	.44	893	.57	994	.70	1089	.83	1176	.98	78%
2000	1371	598	.30	669	.36	744	.42	806	.49	909	.62	1005	.76	1098	.90	1186	1.04	77%
2100	1440	621	.34	687	.40	760	.47	823	.54	926	.68	1018	.82	1108	.96	1195	1.11	76%
2200	1508	646	.39	707	.45	777	.52	840	.59	943	.73	1032	.88	1119	1.03	1204	1.18	76%
2300	1577	669	.43	728	.50	793	.57	857	.64	961	.80	1048	.95	1131	1.11	1214	1.26	75%
2400	1645	694	.49	749	.56	810	.63	874	.71	978	.86	1065	1.02	1145	1.18	1225	1.35	74%
2500	1714	718	.54	771	.62	828	.69	890	.77	995	.93	1082	1.10	1160	1.27	1237	1.44	73%
2600	1783	743	.61	793	.68	847	.76	907	.84	1013	1.01	1099	1.18	1176	1.35	1250	1.53	72%
2700	1851	768	.67	816	.75	867	.83	923	.91	1030	1.09	1117	1.27	1193	1.44	1265	1.63	71%
2800	1920	793	.75	839	.82	888	.91	941	.99	1047	1.17	1134	1.35	1210	1.54	1281	1.73	71%
2900	1988	818	.82	862	.90	909	.99	959	1.08	1064	1.26	1152	1.45	1228	1.64	1297	1.83	70%
3000	2057	843	.90	886	.99	930	1.07	978	1.17	1080	1.35	1169	1.55	1245	1.75	1314	1.95	69%
3100	2126	868	.99	910	1.08	953	1.17	998	1.26	1096	1.45	1186	1.65	1263	1.86	1332	2.07	68%
3200	2194	894	1.09	934	1.18	975	1.27	1018	1.36	1113	1.56	1203	1.76	1280	1.97	1349	2.19	67%
3300	2263	919	1.18	958	1.28	998	1.37	1039	1.47	1130	1.67	1220	1.88	1298	2.10	1367	2.32	67%
3400	2331	945	1.29	983	1.39	1021	1.48	1061	1.58	1147	1.79	1237	2.00	1315	2.22	1384	2.45	66%
3500	2400	971	1.40	1007	1.50	1044	1.60	1082	1.70	1165	1.91	1253	2.13	1332	2.36	1402	2.59	65%

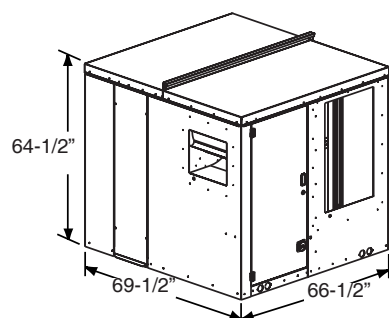
Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 3500 Exhaust

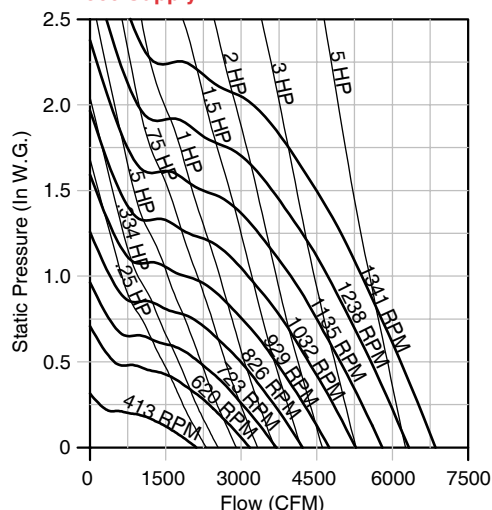
CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
1300	891	467	.12	571	.17	659	.22	732	.27	846	.38							84%
1400	960	485	.14	587	.19	672	.25	748	.31	863	.42							83%
1500	1028	502	.16	603	.22	686	.28	761	.34	881	.46	977	.58					82%
1600	1097	520	.18	620	.25	701	.31	774	.38	898	.51	993	.63	1081	.77			81%
1700	1165	539	.21	637	.28	717	.35	788	.42	913	.56	1011	.69	1096	.83			80%
1800	1234	558	.24	654	.32	733	.39	802	.46	927	.61	1029	.75	1113	.90	1191	1.05	79%
1900	1303	578	.27	672	.36	750	.43	818	.50	941	.66	1045	.82	1130	.97	1207	1.12	78%
2000	1371	599	.31	689	.40	766	.48	834	.55	954	.72	1060	.88	1148	1.04	1224	1.20	77%
2100	1440	621	.35	706	.44	783	.52	850	.61	967	.77	1074	.95	1165	1.12	1242	1.29	76%
2200	1508	642	.40	724	.49	801	.58	867	.67	982	.84	1087	1.02	1180	1.20	1259	1.38	76%
2300	1577	665	.45	742	.54	818	.64	883	.73	997	.91	1100	1.10	1194	1.29	1276	1.47	75%
2400	1645	687	.50	761	.59	835	.70	900	.79	1013	.98	1113	1.17	1207	1.37	1291	1.57	74%
2500	1714	710	.56	780	.65	852	.76	918	.86	1029	1.06	1128	1.26	1220	1.46	1305	1.67	73%
2600	1783	733	.63	800	.72	870	.83	935	.94	1046	1.14	1143	1.35	1234	1.56	1319	1.78	72%
2700	1851	755	.69	820	.79	888	.90	952	1.01	1062	1.23	1158	1.44	1247	1.66	1332	1.88	71%
2800	1920	779	.76	841	.86	906	.97	969	1.09	1079	1.32	1174	1.54	1262	1.76	1345	1.99	71%
2900	1988	802	.84	863	.94	924	1.05	987	1.18	1096	1.42	1190	1.64	1276	1.87	1358	2.11	70%
3000	2057	825	.92	884	1.03	943	1.14	1004	1.27	1113	1.52	1207	1.75	1292	1.99	1372	2.23	69%
3100	2126	848	1.01	906	1.12	963	1.23	1022	1.37	1130	1.62	1224	1.87	1308	2.11	1387	2.36	68%
3200	2194	872	1.10	928	1.22	983	1.33	1040	1.47	1148	1.74	1241	1.99	1324	2.24	1402	2.49	67%
3300	2263	895	1.20	951	1.32	1003	1.44	1058	1.57	1165	1.86	1257	2.11	1340	2.37	1417	2.63	67%
3400	2331	918	1.30	973	1.43	1024	1.55	1077	1.68	1182	1.98	1274	2.25	1357	2.51	1433	2.78	66%
3500	2400	942	1.42	996	1.55	1046	1.67	1096	1.80	1199	2.10	1292	2.39	1374	2.66	1449	2.93	65%

Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

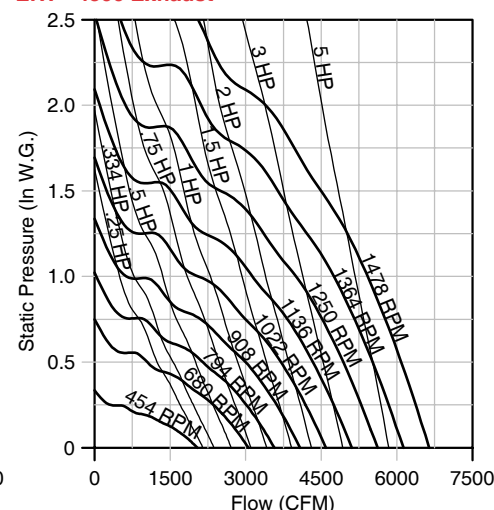
Energy Recovery Wheel Diameter - 48"
 Belt Drive
 Maximum RPM - 1478
 Maximum MHP - 5
 Maximum Motor Frame - 184T
 Housing - 18 ga. steel
 Base - 14 ga. steel
 Shipping Weight (less motors) - 1111 lbs.



ERV - 4500 Supply

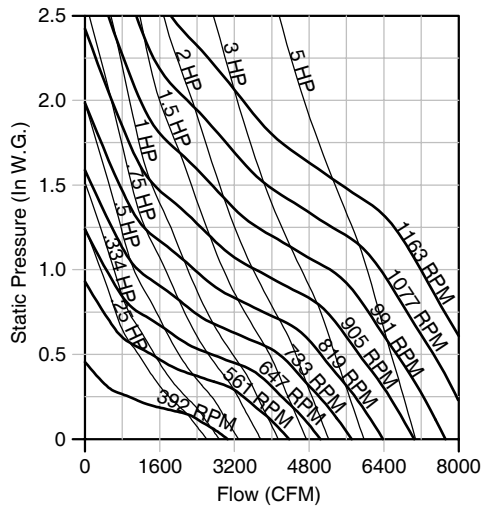


ERV - 4500 Exhaust

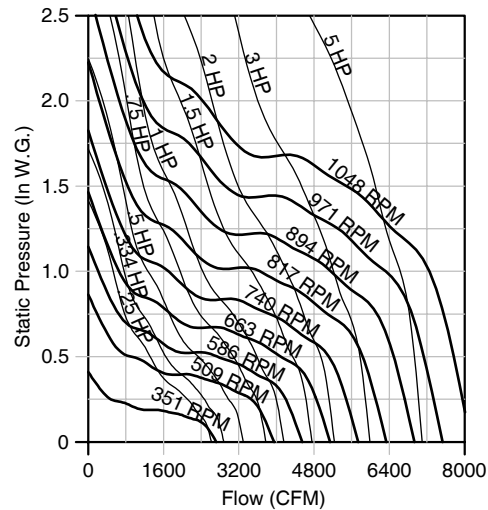


ERV - 5500 Data

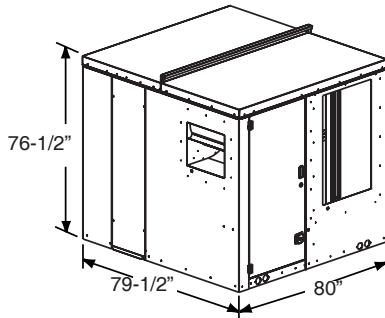
ERV - 5500 Exhaust



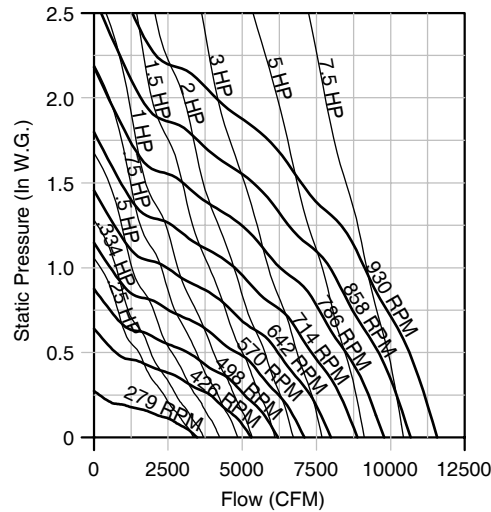
ERV - 5500 Supply



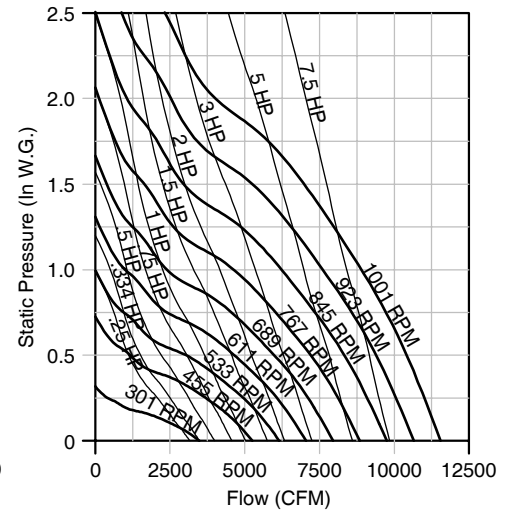
Energy Recovery Wheel Diameter - 60"
 Belt Drive
 Maximum RPM - 1001
 Maximum MHP - 7-1/2
 Maximum Motor Frame - 184T
 Housing - 16 ga. steel
 Base - 12 ga. steel
 Shipping Weight (less motors) - 1609 lbs.



ERV - 7000 Supply



ERV - 7000 Exhaust



ERV - 7000 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
2250	784	279	.15	352	.22	416	.30	471	.39	560	.55	635	.70	710	.98			86%
2500	871	288	.18	362	.26	423	.35	478	.45	569	.63	643	.80	717	1.09	778	1.29	84%
2750	959	300	.21	374	.31	431	.40	484	.50	577	.72	652	.91	717	1.09	778	1.29	83%
3000	1046	314	.26	387	.37	441	.46	492	.57	583	.80	660	1.03	726	1.23	786	1.44	82%
3250	1133	330	.31	397	.43	453	.54	501	.64	590	.88	668	1.14	735	1.38	794	1.59	81%
3500	1220	346	.37	406	.49	465	.62	511	.73	597	.97	675	1.24	743	1.52	803	1.77	80%
3750	1307	362	.44	417	.56	477	.71	523	.83	605	1.07	681	1.35	750	1.65	811	1.94	79%
4000	1395	378	.52	430	.64	487	.79	535	.93	614	1.19	688	1.47	757	1.79	819	2.10	78%
4250	1482	393	.60	445	.74	496	.89	547	1.05	624	1.31	696	1.61	763	1.92	825	2.26	77%
4500	1569	409	.69	461	.84	506	.99	558	1.17	636	1.46	704	1.75	770	2.07	832	2.42	76%
4750	1656	426	.80	477	.96	518	1.10	568	1.29	648	1.61	714	1.91	778	2.24	839	2.60	74%
5000	1743	443	.91	493	1.08	533	1.24	577	1.42	660	1.78	725	2.09	786	2.42	846	2.78	73%
5250	1830	460	1.03	509	1.22	548	1.38	587	1.55	672	1.96	737	2.29	796	2.62	854	2.99	72%
5500	1918	478	1.17	524	1.36	564	1.54	599	1.71	683	2.14	749	2.50	806	2.84	862	3.20	71%
5750	2005	496	1.32	540	1.52	580	1.71	614	1.89	693	2.32	761	2.72	818	3.08	872	3.45	70%
6000	2092	515	1.49	555	1.68	596	1.90	629	2.08	702	2.51	773	2.95	830	3.33	882	3.70	70%
6250	2179	534	1.68	571	1.86	612	2.09	645	2.29	711	2.70	784	3.19	842	3.60	894	3.99	69%
6500	2266	552	1.87	588	2.07	628	2.31	661	2.51	722	2.91	795	3.44	855	3.89	906	4.29	68%
6750	2354	572	2.09	604	2.27	643	2.52	677	2.75	735	3.16	804	3.68	866	4.17	918	4.61	67%
7000	2441	591	2.31	621	2.50	659	2.76	693	3.00	749	3.42	813	3.93	878	4.48	930	4.94	66%

Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

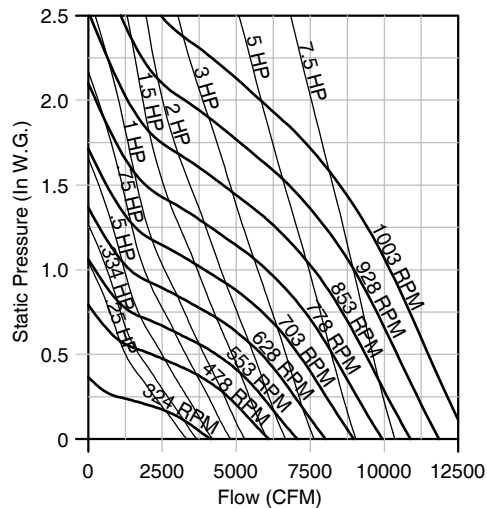
ERV - 7000 Exhaust

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
2250	784	301	.17	381	.27	449	.37	508	.48	604	.71	681	.95	746	1.18	803	1.42	86%
2500	871	315	.22	391	.32	457	.42	515	.54	614	.80	694	1.06	761	1.32	819	1.57	84%
2750	959	330	.27	403	.37	466	.49	523	.61	622	.89	704	1.17	773	1.45	834	1.73	83%
3000	1046	345	.32	416	.44	477	.56	531	.69	629	.98	713	1.29	784	1.59	847	1.90	82%
3250	1133	360	.38	430	.51	488	.64	541	.78	636	1.07	720	1.40	794	1.74	858	2.07	81%
3500	1220	376	.45	444	.60	501	.74	552	.88	645	1.18	728	1.52	802	1.88	867	2.24	80%
3750	1307	393	.53	458	.69	514	.84	564	.99	654	1.31	735	1.65	809	2.03	875	2.41	79%
4000	1395	411	.63	473	.80	527	.95	576	1.11	664	1.45	743	1.79	816	2.18	883	2.59	78%
4250	1482	428	.73	488	.91	541	1.08	589	1.24	674	1.59	752	1.96	823	2.34	890	2.77	77%
4500	1569	447	.85	504	1.04	556	1.22	602	1.39	686	1.76	761	2.13	831	2.52	897	2.95	76%
4750	1656	466	.98	519	1.16	570	1.37	616	1.55	698	1.93	772	2.33	840	2.73	905	3.16	74%
5000	1743	485	1.13	536	1.32	585	1.53	630	1.73	711	2.12	783	2.53	850	2.95	913	3.39	73%
5250	1830	504	1.28	553	1.48	600	1.70	645	1.92	724	2.32	794	2.75	860	3.19	922	3.63	72%
5500	1918	523	1.45	570	1.66	616	1.89	660	2.13	737	2.54	807	2.99	871	3.44	932	3.91	71%
5750	2005	543	1.64	587	1.85	632	2.09	674	2.33	751	2.78	819	3.23	883	3.72	942	4.19	70%
6000	2092	563	1.85	605	2.06	648	2.30	690	2.57	765	3.04	832	3.49	895	4.00	953	4.49	70%
6250	2179	583	2.07	624	2.30	665	2.54	705	2.81	779	3.31	846	3.79	907	4.29	965	4.82	69%
6500	2266	603	2.30	642	2.54	681	2.78	721	3.07	794	3.61	859	4.09	920	4.61	976	5.14	68%
6750	2354	623	2.56	661	2.81	699	3.06	737	3.34	809	3.92	873	4.43	933	4.95	989	5.51	67%
7000	2441	644	2.84	680	3.09	716	3.34	753	3.63	824	4.25	887	4.78	946	5.31	1001	5.87	66%

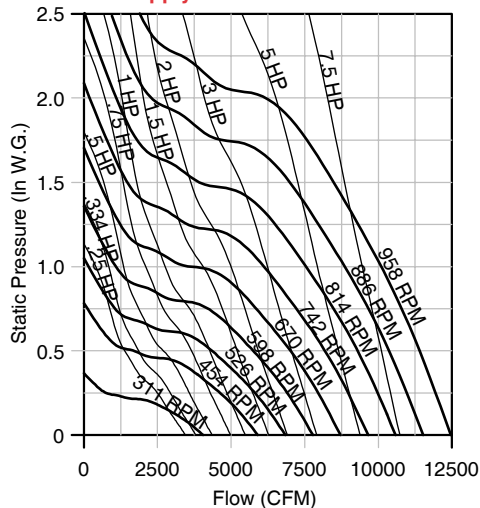
Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 8500 Data

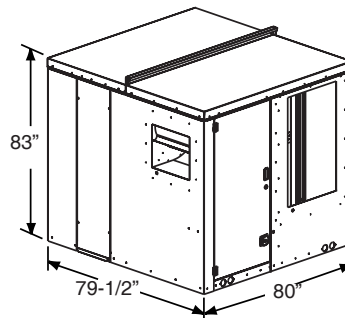
ERV - 8500 Exhaust



ERV - 8500 Supply



Energy Recovery Wheel Diameter - 66"
Belt Drive
Maximum RPM - 1003
Maximum MHP - 7-1/2
Maximum Motor Frame - 184T
Housing - 16 ga. steel
Base - 12 ga. steel
Shipping Weight (less motors) - 1734 lbs.



ERV - 8500 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
3100	1081	311	.26	373	.35	427	.45	479	.55	580	.82	662	1.09	730	1.33	791	1.57	84%
3400	1185	329	.33	388	.42	439	.52	487	.63	581	.89	668	1.20	739	1.49	800	1.75	83%
3700	1290	346	.40	403	.51	452	.61	497	.72	585	.98	670	1.30	745	1.63	808	1.93	82%
4000	1395	365	.49	419	.60	467	.72	510	.83	591	1.09	672	1.40	748	1.76	815	2.11	81%
4300	1499	384	.58	436	.71	482	.83	523	.95	600	1.21	676	1.52	750	1.88	819	2.27	80%
4600	1604	404	.69	453	.83	497	.96	538	1.09	612	1.37	682	1.66	752	2.01	821	2.42	79%
4900	1708	424	.82	470	.96	513	1.11	553	1.25	624	1.53	691	1.83	757	2.18	823	2.57	78%
5200	1813	444	.96	488	1.11	530	1.27	568	1.41	638	1.71	702	2.03	764	2.36	827	2.75	76%
5500	1918	465	1.12	506	1.28	547	1.45	584	1.60	652	1.91	714	2.24	773	2.58	832	2.95	75%
5800	2022	486	1.29	525	1.46	564	1.63	601	1.81	667	2.13	727	2.47	784	2.82	840	3.19	74%
6100	2127	507	1.48	544	1.66	582	1.85	617	2.02	682	2.37	741	2.72	796	3.08	850	3.46	73%
6400	2232	528	1.69	564	1.88	600	2.08	634	2.26	698	2.63	755	2.99	809	3.36	861	3.75	72%
6700	2336	550	1.92	584	2.12	618	2.32	651	2.51	714	2.91	770	3.28	823	3.67	873	4.07	71%
7000	2441	572	2.18	604	2.38	637	2.59	669	2.80	730	3.21	786	3.61	837	4.00	886	4.41	70%
7300	2545	593	2.44	624	2.65	656	2.88	687	3.10	746	3.52	801	3.94	852	4.36	900	4.78	69%
7600	2650	616	2.75	645	2.96	675	3.19	705	3.41	763	3.87	817	4.31	867	4.74	914	5.17	68%
7900	2755	637	3.06	666	3.29	695	3.53	724	3.76	780	4.23	833	4.69	882	5.14	928	5.58	68%
8200	2859	659	3.40	687	3.65	715	3.89	743	4.13	797	4.61	849	5.10	898	5.57	943	6.03	67%
8500	2964	681	3.77	708	4.02	735	4.27	762	4.53	815	5.03	866	5.54	913	6.01	958	6.50	66%

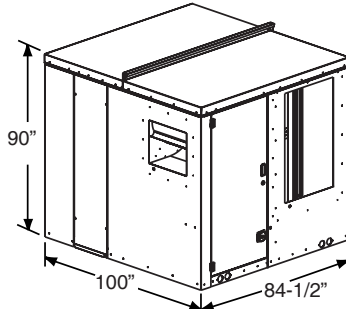
Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 8500 Exhaust

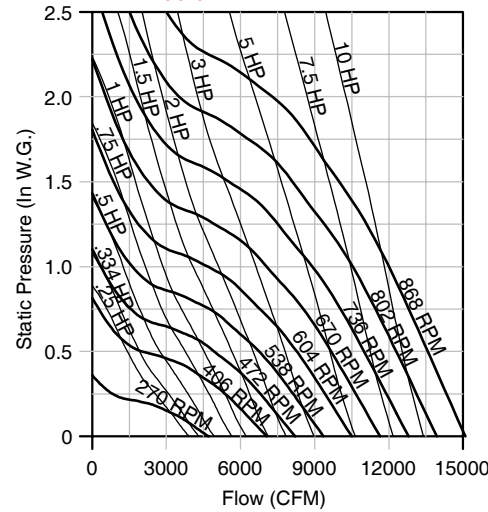
CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	Effectiveness
3100	1081	324	.30	393	.41	453	.53	507	.65	599	.89	677	1.15	747	1.42	810	1.71	84%
3400	1185	342	.37	406	.49	464	.62	517	.75	609	1.01	686	1.28	755	1.57	818	1.87	83%
3700	1290	361	.46	421	.58	477	.72	528	.86	618	1.14	696	1.43	764	1.73	827	2.05	82%
4000	1395	380	.55	436	.69	490	.84	539	.98	628	1.29	705	1.60	773	1.91	836	2.24	81%
4300	1499	400	.66	453	.81	504	.96	552	1.13	638	1.45	715	1.78	783	2.11	845	2.45	80%
4600	1604	421	.79	471	.95	519	1.11	565	1.28	649	1.63	724	1.97	793	2.33	854	2.68	79%
4900	1708	442	.94	489	1.10	534	1.26	579	1.45	660	1.81	734	2.18	802	2.56	864	2.94	78%
5200	1813	463	1.10	508	1.27	551	1.44	593	1.63	673	2.02	745	2.41	812	2.81	873	3.20	76%
5500	1918	484	1.27	527	1.46	569	1.65	609	1.84	686	2.24	756	2.65	822	3.07	883	3.50	75%
5800	2022	506	1.48	547	1.67	587	1.87	625	2.06	699	2.47	768	2.91	832	3.35	893	3.80	74%
6100	2127	527	1.69	567	1.89	605	2.10	642	2.31	713	2.73	781	3.20	844	3.66	903	4.12	73%
6400	2232	549	1.93	588	2.15	624	2.36	659	2.57	728	3.02	794	3.49	855	3.97	914	4.47	72%
6700	2336	571	2.19	609	2.43	644	2.65	677	2.86	744	3.33	808	3.82	868	4.32	925	4.83	71%
7000	2441	592	2.47	630	2.73	663	2.95	696	3.18	760	3.67	822	4.17	881	4.69	937	5.22	70%
7300	2545	615	2.79	651	3.05	683	3.28	715	3.53	776	4.01	836	4.53	894	5.07	949	5.62	69%
7600	2650	637	3.12	672	3.39	704	3.65	734	3.89	793	4.40	852	4.94	908	5.49	962	6.06	68%
7900	2755	659	3.48	693	3.76	724	4.02	754	4.29	811	4.81	867	5.36	922	5.93	975	6.51	68%
8200	2859	681	3.86	715	4.17	745	4.44	774	4.72	829	5.25	884	5.83	937	6.40	989	7.01	67%
8500	2964	703	4.27	736	4.59	766	4.88	794	5.17	848	5.73	901	6.32	952	6.90	1003	7.52	66%

Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

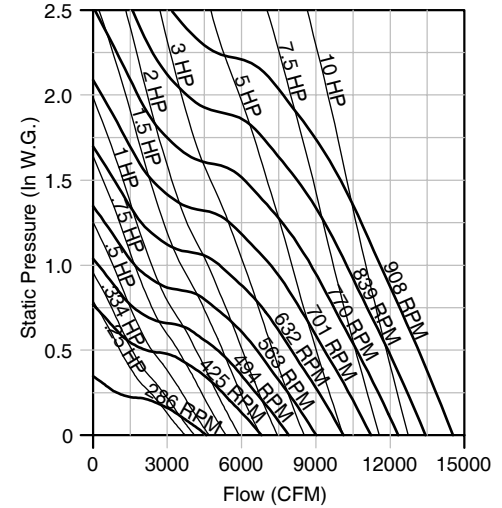
Energy Recovery Wheel Diameter - 72"
 Belt Drive
 Maximum RPM - 908
 Maximum MHP - 10
 Maximum Motor Frame - 215T
 Housing - 16 ga. steel
 Base - 10 ga. steel
 Shipping Weight (less motors) - 2817 lbs.



ERV - 10000 Supply



ERV - 10000 Exhaust



ERV - 10000 Supply

CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
3400	799	270	.26	330	.37	381	.49	429	.61	510	.88	582	1.15					85%
3700	869	282	.31	341	.43	389	.56	435	.69	516	.97	586	1.27	649	1.56			84%
4000	940	296	.38	351	.50	399	.64	442	.78	522	1.07	591	1.39	653	1.70	710	2.01	83%
4300	1010	309	.45	362	.58	409	.72	450	.87	528	1.18	596	1.51	657	1.85	714	2.19	82%
4600	1081	324	.53	373	.66	420	.82	460	.97	534	1.30	602	1.64	663	2.00	718	2.36	81%
4900	1151	338	.62	385	.76	431	.93	471	1.09	541	1.42	608	1.78	669	2.16	723	2.54	80%
5200	1222	353	.72	398	.87	441	1.04	481	1.21	550	1.57	614	1.93	675	2.33	729	2.73	79%
5500	1292	368	.84	411	.99	452	1.16	492	1.35	559	1.71	621	2.10	680	2.50	735	2.92	78%
5800	1363	383	.96	425	1.13	464	1.30	502	1.49	569	1.88	629	2.28	687	2.70	741	3.13	77%
6100	1433	398	1.10	439	1.28	476	1.46	513	1.65	580	2.06	637	2.46	693	2.90	747	3.35	77%
6400	1504	414	1.25	453	1.44	489	1.63	524	1.82	590	2.24	647	2.67	701	3.12	753	3.58	76%
6700	1575	430	1.42	467	1.61	502	1.81	536	2.01	601	2.45	657	2.89	709	3.35	760	3.83	75%
7000	1645	445	1.59	482	1.80	515	2.00	548	2.21	611	2.66	668	3.13	719	3.61	767	4.09	74%
7300	1716	461	1.78	496	2.00	529	2.21	561	2.44	622	2.89	678	3.37	728	3.86	776	4.38	73%
7600	1786	477	1.99	511	2.22	543	2.44	574	2.67	633	3.14	689	3.64	739	4.15	785	4.67	72%
7900	1857	493	2.22	526	2.46	557	2.69	587	2.92	644	3.40	700	3.93	749	4.44	795	4.98	71%
8200	1927	509	2.46	542	2.72	572	2.96	601	3.20	656	3.69	710	4.21	760	4.76	805	5.31	71%
8500	1998	525	2.71	557	2.99	586	3.23	614	3.47	668	3.99	721	4.53	770	5.08	815	5.65	70%
8800	2068	542	3.00	572	3.27	601	3.54	628	3.78	681	4.32	732	4.87	781	5.44	826	6.02	69%
9100	2139	558	3.29	588	3.59	616	3.86	643	4.13	693	4.64	743	5.21	792	5.82	837	6.42	68%
9400	2209	574	3.61	604	3.92	631	4.20	657	4.47	707	5.02	755	5.59	802	6.19	847	6.81	67%
9700	2280	590	3.93	619	4.25	646	4.55	671	4.83	720	5.40	767	5.99	813	6.60	858	7.24	67%
10000	2350	607	4.30	635	4.63	661	4.93	686	5.22	734	5.81	779	6.40	824	7.02	868	7.67	66%

Gross supply air performance ratings (airflow, pressure and power) are at Port 2 with Port 1, Port 3, and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERV - 10000 Exhaust

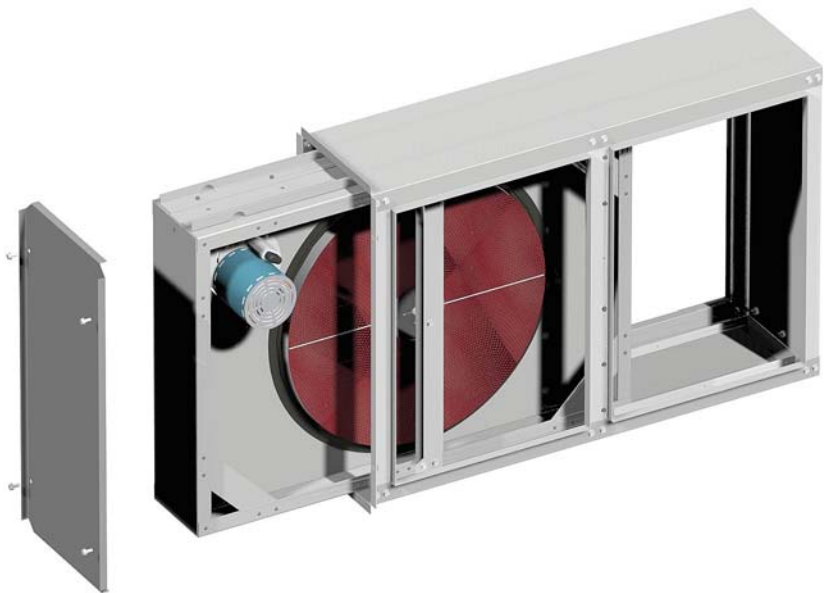
CFM	OV	0.125 SP		0.250 SP		0.375 SP		0.500 SP		0.750 SP		1.000 SP		1.250 SP		1.500 SP		Wheel Effectiveness
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
3400	799	286	.31	344	.43	395	.56	441	.70	528	1.01							85%
3700	869	301	.37	355	.50	405	.64	449	.79	531	1.11	608	1.47					84%
4000	940	316	.44	367	.58	415	.73	459	.89	536	1.22	610	1.59	679	1.99			83%
4300	1010	331	.53	380	.68	426	.83	469	1.00	543	1.34	613	1.72	681	2.14	743	2.56	82%
4600	1081	347	.62	394	.79	437	.95	479	1.12	552	1.48	618	1.86	683	2.29	745	2.74	81%
4900	1151	362	.72	409	.91	450	1.08	489	1.25	562	1.63	626	2.03	687	2.46	747	2.92	80%
5200	1222	378	.84	423	1.03	463	1.22	501	1.40	572	1.80	634	2.20	693	2.65	750	3.11	79%
5500	1292	394	.97	439	1.18	476	1.37	513	1.57	582	1.97	644	2.40	700	2.85	755	3.33	78%
5800	1363	411	1.12	454	1.33	491	1.54	525	1.74	592	2.16	654	2.62	709	3.08	761	3.55	77%
6100	1433	427	1.27	469	1.50	505	1.72	539	1.94	603	2.37	663	2.83	718	3.31	769	3.81	77%
6400	1504	444	1.45	485	1.69	520	1.92	552	2.14	614	2.59	673	3.07	728	3.58	778	4.09	76%
6700	1575	461	1.64	500	1.88	535	2.13	567	2.38	626	2.84	683	3.32	738	3.85	787	4.37	75%
7000	1645	478	1.84	516	2.10	551	2.37	581	2.61	639	3.11	694	3.60	747	4.13	797	4.69	74%
7300	1716	495	2.06	532	2.34	566	2.61	596	2.87	652	3.39	706	3.91	758	4.45	807	5.02	73%
7600	1786	513	2.31	548	2.59	581	2.87	611	3.15	666	3.70	718	4.23	768	4.77	817	5.36	72%
7900	1857	530	2.57	565	2.87	597	3.16	626	3.44	680	4.02	730	4.56	779	5.12	827	5.73	71%
8200	1927	547	2.84	581	3.16	613	3.47	642	3.77	694	4.36	743	4.93	791	5.51	837	6.11	71%
8500	1998	565	3.14	597	3.46	628	3.78	657	4.10	708	4.71	756	5.31	803	5.92	848	6.52	70%
8800	2068	583	3.47	614	3.80	644	4.13	673	4.46	723	5.09	770	5.73	815	6.34	859	6.96	69%
9100	2139	601	3.82	631	4.16	660	4.49	688	4.83	738	5.50	784	6.16	828	6.79	871	7.43	68%
9400	2209	618	4.17	648	4.54	676	4.88	704	5.24	753	5.92	798	6.60	841	7.26	883	7.92	67%
9700	2280	636	4.56	665	4.94	693	5.31	720	5.67	768	6.36	812	7.06	854	7.75	895	8.42	67%
10000	2350	654	4.97	682	5.36	709	5.73	735	6.10	784	6.85	827	7.57	868	8.28	908	8.98	66%

Gross exhaust air performance ratings (airflow, pressure and power) are to Port 3 with Port 1, Port 2 and Port 4 at 0.0 In. W.G. Power rating (BHP) does not include drive losses. Performance ratings include the effects of filters in the airstream.

ERC Energy Recovery Cassette

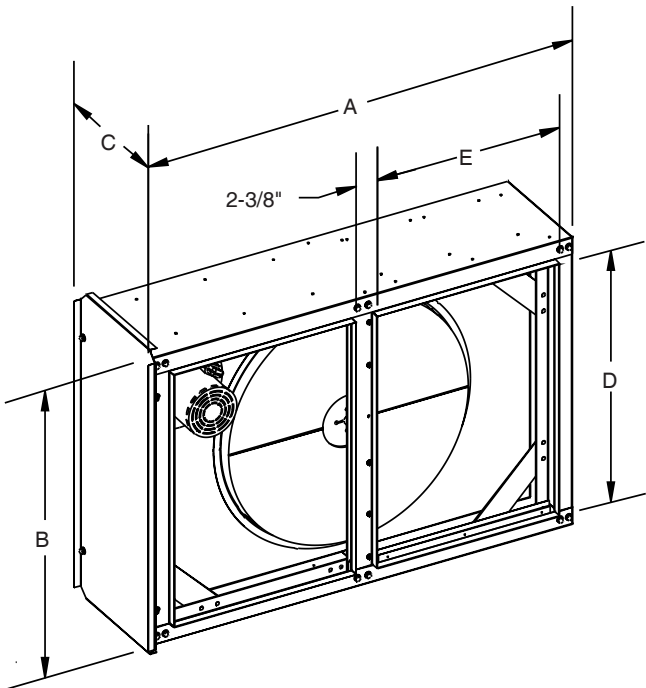
ERC

The Cook model ERC (Energy Recovery Cassette) offers an alternative way to incorporate an Energy Recovery Wheel into an HVAC system. The ERC houses an Energy Recovery Wheel Cassette and provides 1 inch duct flanges for attachment of both the intake and exhaust air ductwork. The housing is fully insulated and includes an access door allowing the wheel cassette to slide out for cleaning and maintenance. The ERC also includes a wiring box, a twistlock wheel motor disconnect plug, and mounting brackets.



Installation

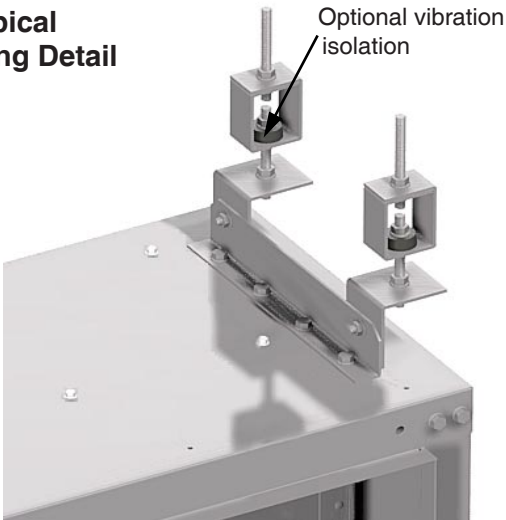
The ERC must be installed with the wheel oriented vertically. It is important that filters are provided to maintain the efficiency of the energy recovery wheel. Refer to ERV Installation, Operation and Maintenance manual for cassette clearance dimensions.



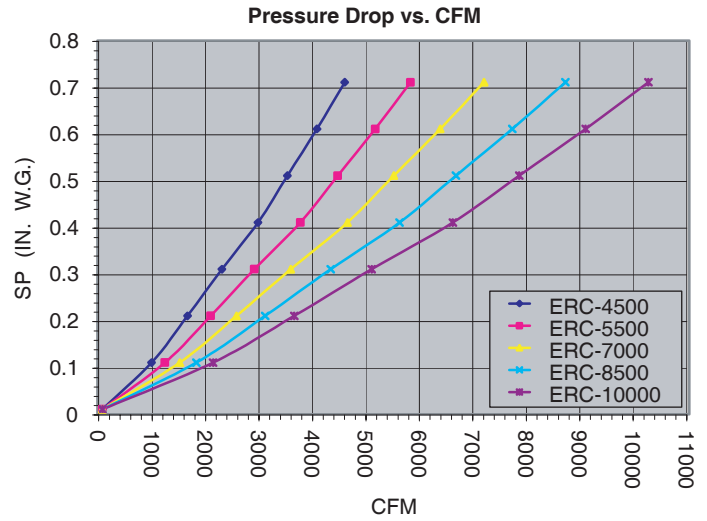
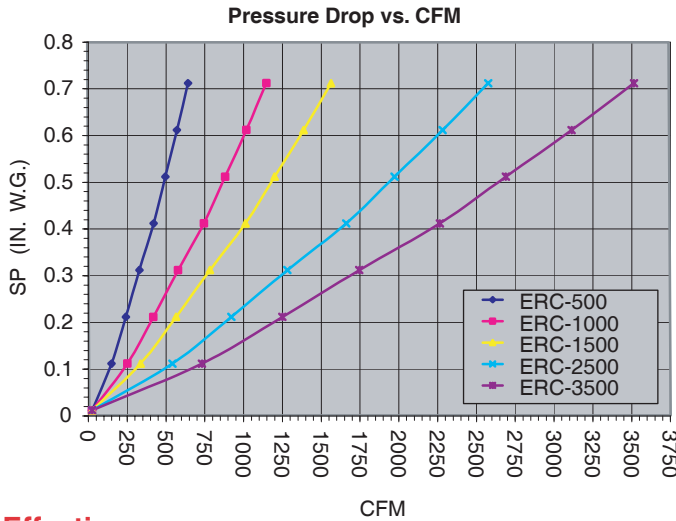
Size	A	B	C	Duct Connection		Approx. Ship. Wt.
				D	E	
ERC-500	27-5/16	22-5/8	16-5/8	19-9/16	8-15/16	120
ERC-1000	32-5/16	28-5/8	16-5/8	25-9/16	11-7/16	163
ERC-1500	52-3/16	35-5/8	18-9/16	32-9/16	21-3/8	278
ERC-2500	54-11/16	45-5/8	18-9/16	42-9/16	22-5/8	379
ERC-3500	63-1/2	51-5/8	18-9/16	48-9/16	27	466
ERC-4500	69-11/16	57-5/8	18-9/16	54-9/16	30-1/8	553
ERC-5500	69-11/16	63-5/8	18-9/16	60-9/16	30-1/8	636
ERC-7000	82-11/16	69-5/8	21-1/8	66-9/16	36-5/8	781
ERC-8500	82-11/16	75-5/8	21-1/8	72-9/16	36-5/8	868
ERC-10000	87-1/4	81-5/8	27-7/8	78-9/16	38-7/8	1064

All weights in pounds.

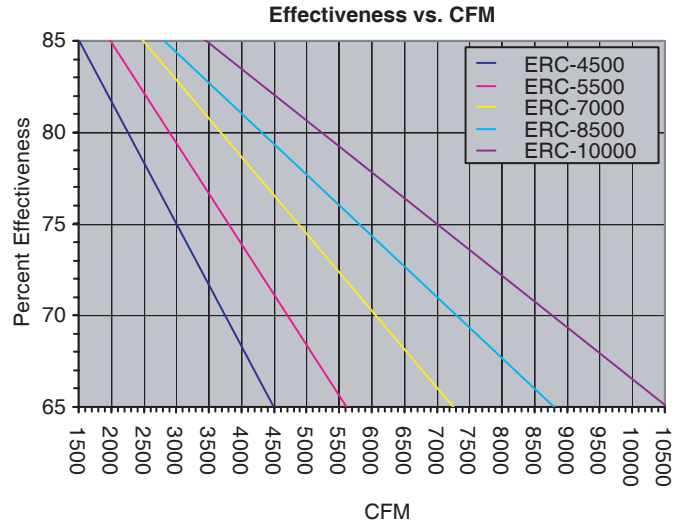
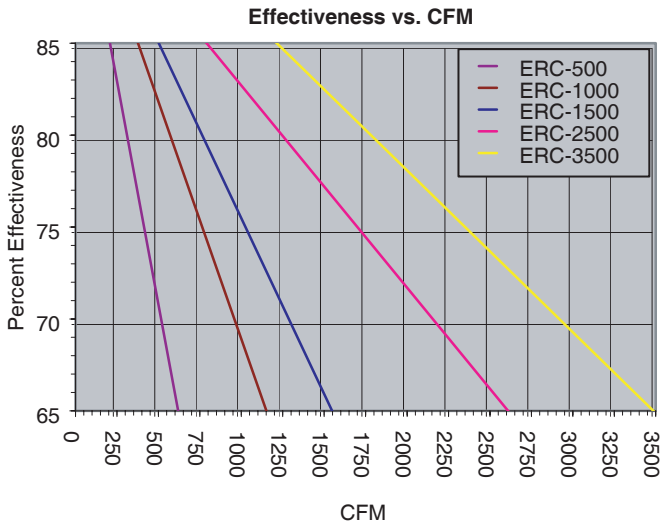
Typical Mounting Detail



Pressure Drop



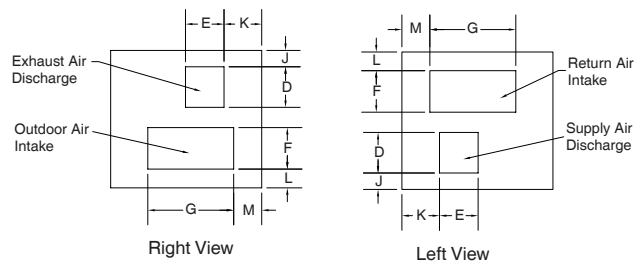
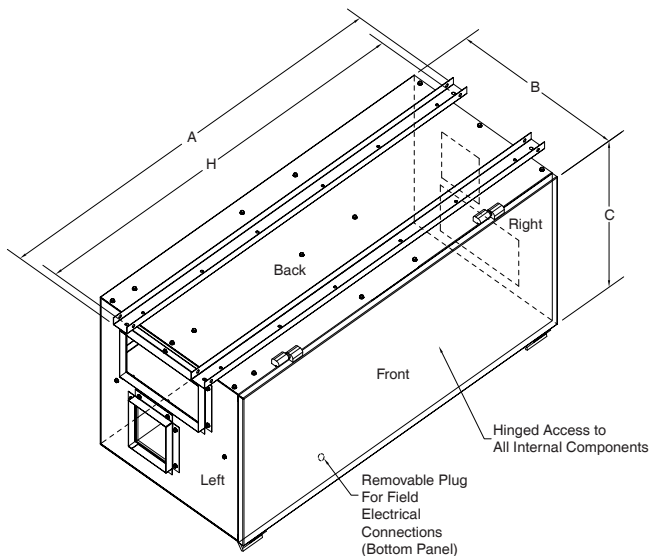
Effectiveness



Dimensions - Direct Drive

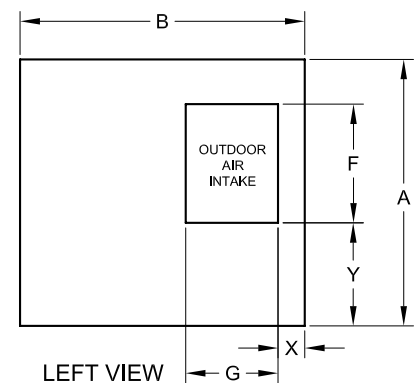
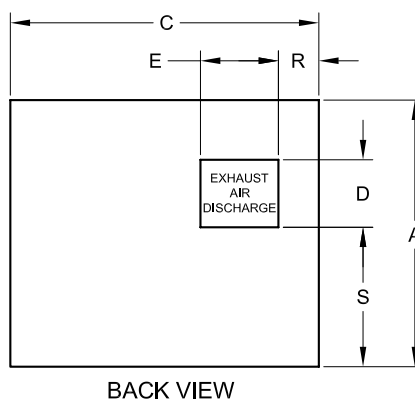
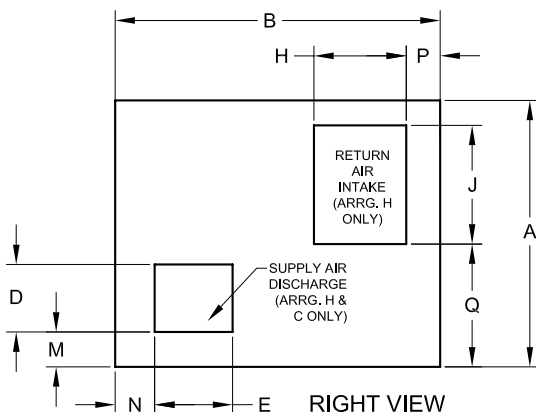
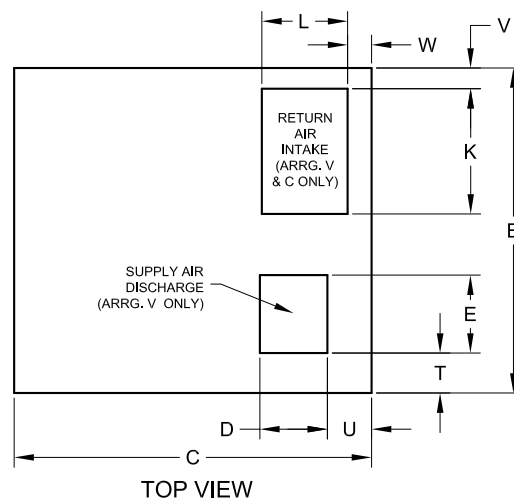
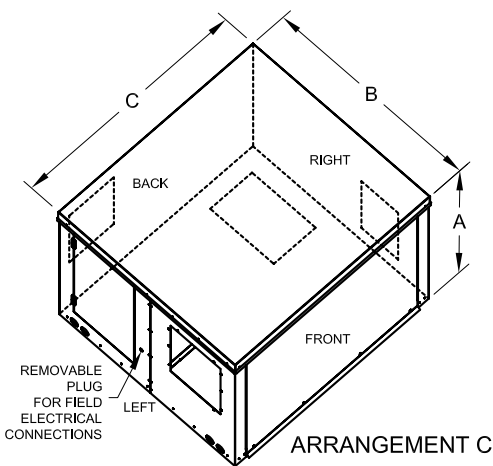
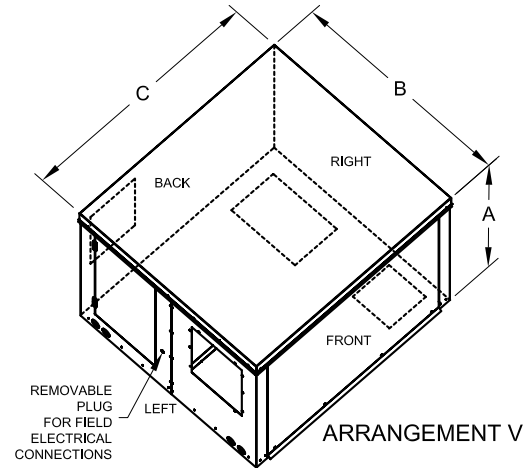
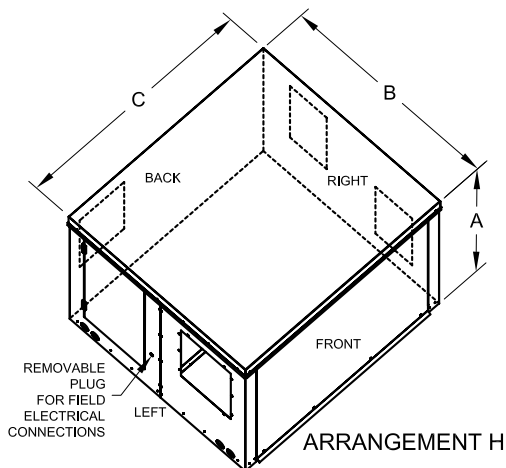
Unit	Mounting Rail Length	Housing Width	Housing Height	Exhaust Opening		Intake Opening		Mounting Holes	J	K	L	M
	A	B	C	D	E	F	G	H				
ERV 500	52	22	23-13/16	7	5-11/16	7	12	50	4	5-5/16	1-1/2	4
ERV 1000	52	26	28-13/16	10-3/8	6-7/8	7	20	50	6-11/16	11-7/16	1-1/2	4

All dimensions in inches.



ERV Belt Drive Ductwork Connections

Size	A	B	C		D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y
			Std.	w/coils																				
1500	40-1/2	49-1/4	54-1/4	90-1/4	10-1/4	11-13/16	18	14	14	18	19	13	5-5/16	6	5-1/8	18-5/8	6-1/8	21-1/8	6-1/16	6-11/16	3-3/16	3	4-1/16	15-5/8
2500	50	52	52	88	11-3/8	13-1/8	28	20	20	28	22	12-3/4	9-7/8	7-3/8	5-9/16	13-1/4	5-1/16	29-5/16	7-5/16	7-1/16	4-1/4	3-1/4	2-7/8	18-1/4
3500	59	60-1/2	64-1/2	100-1/2	13-7/16	15-5/8	34	20	20	34	23	16-1/2	10-7/8	8-13/16	5-5/16	18	5-7/8	33-13/16	8-13/16	7-13/16	4-1/16	4-1/16	6-1/4	18-1/16
4500	64-1/2	66-1/2	69-1/2	105-1/2	13-7/16	15-5/8	34	4	24	34	26	18-3/4	10-13/16	7-3/16	4-5/16	23-13/16	7-5/16	38-5/8	10	8-1/8	4-1/16	4-1/16	5-1/4	23-7/8
5500	71	66-1/2	69-1/2	105-1/2	15-7/8	18-5/8	44	24	23	42	26	18-3/4	12-1/4	8-7/8	4-5/16	22	5-7/16	41	8-13/16	9-3/8	4-3/4	4-3/16	5-1/4	20-1/8
7000	75-1/2	80	79-1/2	115-1/2	18-7/8	21-7/8	44	29	27	42	32	24	14-1/4	9-1/16	7-1/8	27-7/8	6-3/16	14-3/16	8-15/16	11-1/8	4-1/8	4-1/8	6-15/16	25-15/16
8500	83	80	79-1/2	115-1/2	18-7/8	21-7/8	53	29	27	46	32	24	14-1/4	9-3/16	7-1/8	29-7/8	6-3/16	14-3/16	8-15/16	11-1/8	4-1/8	4-1/8	6-15/16	22-15/16
10000	90	84-1/2	100	136	24-3/4	24-3/4	50	37	32	48	34-1/2	33	15-7/16	8-1/4	4-3/8	33-7/8	9-1/8	15-1/4	8	12-3/4	4-1/8	4-1/8	3-1/4	31-15/16





LOREN COOK COMPANY

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