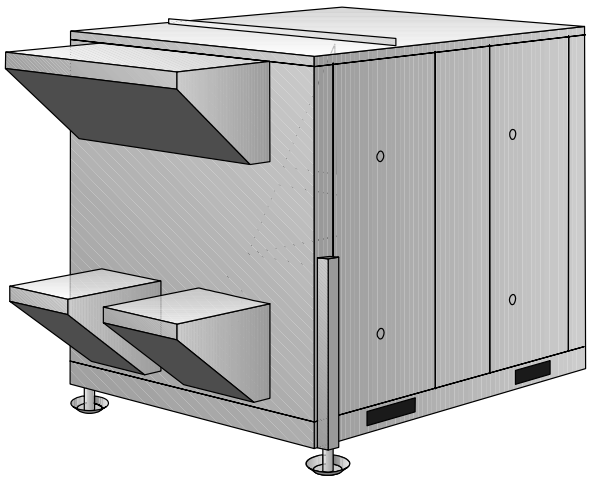
ENGINEERING DATA

ERW SERIES
ENERGY RECOVERY WHEEL
(For Use With 16/24 and L Series Packaged Units)
Up To 85% Balanced Flow Effectiveness

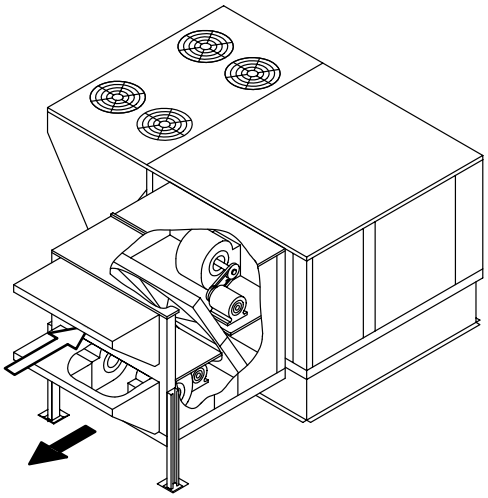
ERW

Bulletin #210122
August 1996
Supersedes April 1996

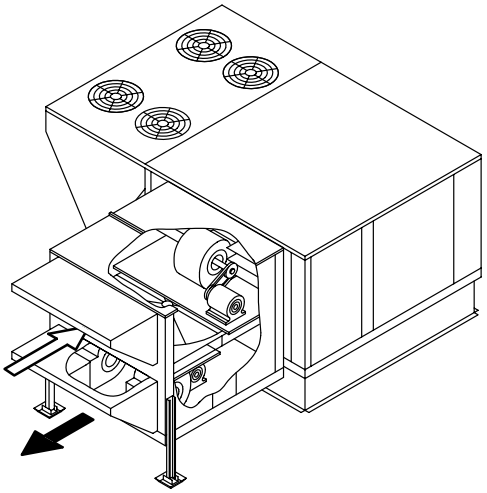
- Reduces cooling load at design temperatures by up to 4 tons per 1000 cfm (14.1 kW per 470 L/s).
- Reduces heating load by up to 52,000 Btuh per 1000 cfm (15.2 kW per 470 L/s) at 10°F (–12°C) design temperature.
- Dry energy transfer. Moisture in supply air stream is transferred to exhaust air stream in a vapor state, eliminating condensate plumbing.
- Attaches directly to Lennox rooftop units. Mounting rails are provided for attachment to unit base railing. 16 and 24 Series 7.5 Ton units require duct transition (furnished).
- Separate fused power supply.
- Filters are provided for entering and exhaust air supplies. Filters are washable and reusable.
- Adjustable support legs provided.
- Two modes of operation (Pivoting Wheel Models).
  - Recovery mode during normal energy recovery operation.
  - Economizer mode when outdoor sensor calls for economizer operation (packaged units equipped with economizer).
- Pivoting wheel models used with packaged units with economizer. Sequence of operation controlled by economizer.
- Balancing dampers provided on Fixed Wheel Models.
- Centrifugal blowers (both supply and exhaust) for high static capability and low sound levels.
- Belt drive blowers with adjustable drives.
- Blower wheel shaft is supported with sealed ball bearings.
- Heavy gauge galvanized steel cabinets corrosion protected with powder paint process.
- Fully insulated cabinet.
- Internal enthalpy wheel made of removable, washable plastic pie shaped wedges. Wedges are removable without tools for inspection and cleaning.
- Continuous operation down to 10°F (–12°C) without defrost at indoor relative humidity up to 40%. For temperatures below 10°F (–12°C), Optional Low Ambient Control Kit is required. Kit includes temperature sensor to shutoff power to ERW before frost build–up can occur on recovery wheel.
- Staged power exhaust (15 Ton and larger models).



Typical Applications



ERW Unit With L Series Packaged Unit
(Recovery Wheel Mode)
(Wheel in operation)



ERW Unit With L Series Packaged Unit
(Economizer/Power Exhaust Mode)
(Wheel pivoted for Economizer operation)

♁ The maple leaf symbol in this bulletin denotes Canadian only usage where applicable

NOTE — Due to Lennox' ongoing committment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.

APPLICATIONS

Energy Recovery Wheels (ERW) are used with 16/24 and L Series units. The internal enthalpy wheel provides sensible and latent energy exchange between the entering and exhaust air streams of a building. This allows energy which is normally lost in the exhaust air stream to be returned into the entering air.

Principal of Operation

The ERW enthalpy wheel contains several pie shaped sections with several layers of a desiccant coated polymeric energy transfer surface. As the wheel rotates through each air stream, wheel absorbs sensible and latent energy. In heating mode, the wheel rotates to provides a constant transfer of heat from the exhaust air stream to the colder intake air stream. During cooling season, the process is reversed. On units equipped with an economizer, the wheel pivots out of the air stream to allow economizer to operate normally for "free cooling" when outdoor temperature and humidity is acceptable.
Sensible and latent energy are two components of total energy. Sensible energy is the amount of energy found in the dry portion of the air. The latent energy is the amount of energy provided within the moisture of the air stream. The ERW transfers moisture in the vapor phase so there are no condensate drains needed or wet surfaces to promote fungal growth.
As recovery wheel rotates, air flow direction is reversed every 1/2 rotation keeping dirt and dust particles from accumulating on wheel, which could cause poor performance.

Application Example

The increased amount of outside air required to comply with Indoor Air Quality (IAQ) standards is having an adverse effect on building space comfort conditions. Up to two and a half times as much ventilation air is required. The example below shows an existing air conditioned office space with 75 people served by a rooftop unit.

In all cases the net effect of the outside air load has been reduced to a level less then the "original ventilation load". This means no additional air conditioning units or modifications to the interior duct system would be required. All the changes required would be outside the conditioned space with little or no disruption to business activities or any inconvenience to employees. Assuming the building has 10 of these same sized systems, the total tonnage saved would be the following amounts and the building would now comply with new Indoor Air Quality (IAQ) standards.

Applying the ERW energy recovery system to these conditions, the system will recover 75%+ of enthalpy between the exhaust air stream and the make up air stream through the desiccant impregnated media. This means the ventilation load with the heat recovery system will be 25% of the "new ventilation load".

HOA = Enthalpy of outside air (Btu/lb.°F) **TOA = Temperature of Outdoor Air (°F db)**
HSA = Enthalpy of supply air (Btu/lb.°F) **TSA = Temperature of Supply Air (°F db)**

Cities		Chicago, IL	Dallas, TX	Los Angeles, CA	Miami, FL	Toronto, ON Canada	Calgary, AB Canada
Space Conditions (°F wb/°F db)		Summer Conditions – 76°F db and 50% relative humidity Winter Conditions – 73°F db and 40% relative humidity					
Climatic Conditions (97.5% design)		Summer (Winter)	Summer (Winter)	Summer (Winter)	Summer (Winter)	Summer (Winter)	Summer (Winter)
Design dry bulb/wet bulb (°F wb/°F db)		90/77 (2db)	100/75 (22db)	91/74 (40db)	89/70 (48db)	87/72 (–1db)	- - - - (–23db)
Original Ventilation Load – Btuh (Summer–75 people x 7.5 cfm x 4.5 x (HOA–HSA) †(Winter–75 people x 7.5 cfm x 1.8 x (TOA–TSA)		29,500 (71,900)	24,600 (51,600)	22,200 (33,400)	13,200 (25,300)	17,500 (74,900)	- - - - (97,200)
New Ventilation Load – Btuh (Summer–75 people x 20 cfm x 4.5 x (HOA–HSA) †(Winter–75 people x 20 cfm x 1.8 x (TOA–TSA)		78,600 (191,700)	65,500 (137,000)	59,100 (89,100)	35,100 (67,500)	46,600 (199,800)	- - - - (259,200)
Additional load to existing conditions – Btuh		49,100 (19,300)	40,900 (85,400)	37,000 (55,700)	21,900 (42,200)	29,200 (124,900)	- - - - (162,000)
New Ventilation Load – Btuh With ERW operating at 75% effectiveness (Summer–75 people x 7.5 cfm x 4.5 x (HOA–HSA) x 0.25) †(Winter–75 people x 7.5 cfm x 1.8 x (TOA–TSA) x 0.25)		19,700 (18,000)	16,400 (12,900)	14,800 (8350)	8775 (6300)	11,700 (18,700)	- - - - (24,300)
Total energy saved on 10 similar systems per new IAQ requirement	Cooling – Tons	49	41	32	22	29	- - - -
	Heating – Btuh	180,000	129,000	83,500	63,000	187,000	243,000

†**Negative value**

WEIGHTS

ERW Size (Tons)	Wheel Type	Net Weight – lbs. (kg)	Shipping Weight – lbs. (kg)
7.5 thru 12 Ton	Fixed	515 (234)	600 (272)
	Pivoting		
15 thru 20 Ton	Fixed	845 (383)	850 (386)
	Pivoting	996 (452)	1000 (454)

SPECIFICATIONS AND ELECTRICAL DATA

PIVOTING WHEEL MODELS

Models No.		16ERWR95/160 24ERWR95/160, LAERWR09/15			LAERWR18/24		
Line Voltage – 60hz		208/230v	460v	575v	208/230v	460v	575v
Fresh Air Blower	Motor – hp (3 phase)	1/2			1–1/2		
	Wheel Size (diameter x width) – in	10 x 10			12 x 9		
	Motor Speed – rpm	1725			1725		
	Full Load Amps	2.0	1.0	0.8	4.8	2.4	1.9
	Service Factor	1.25			1.25		
Exhaust Air Blower	Motor – hp (3 phase)	1–1/2			(2) 3		
	Wheel Size (diameter x width) – in	10 x 10			(2) 12 x 9		
	Motor Speed – rpm	1725			1725		
	Full Load Amps	4.8	2.4	1.9	7.8	3.9	3.1
	Service Factor	1.25			1.15		
Enthalpy Wheel	Motor – hp (1 phase)	1/40			1/10		
	Potential – Volts	115			200–208/230		
	Wheel Diameter – in	36			52–1/4		
	Wheel surface area – sq. ft. (m^2)	1000 (92.9)			1600 (148.6)		
	Wheel rotation	30 rpm					
	Motor Speed – rpm	600			600		
	Full Load Amps	0.95			1.1		
	Power Consumption – Watts	112			150		
Total Electrical Requirements	Minimum Circuit Ampacity	10	5.75	5	17.1	9.25	7.8
	Maximum Fuse Size – Amps	15	10	8	25	15	12

FIXED WHEEL MODELS

Models No.		16ERWF95/160 24ERWF95/160, LAERWF09/15			LAERWF18/24		
Line Voltage – 60hz		208/230v	460v	575v	208/230v	460v	575v
Fresh Air Blower	Motor – hp (3 phase)	1 – 1/2			1–1/2		
	Wheel Size (diameter x width) – in	10 x 10			12 x 9		
	Motor Speed – rpm	1725			1725		
	Full Load Amps	4.8	2.4	1.9	4.8	2.4	1.9
	Service Factor	1.25			1.25		
Exhaust Air Blower	Motor – hp (3 phase)	1–1/2			1–1/2		
	Wheel Size (diameter x width) – in	10 x 10			12 x 9		
	Motor Speed – rpm	1725			1725		
	Full Load Amps	4.8	2.4	1.9	4.8	2.4	1.9
	Service Factor	1.25			1.25		
Enthalpy Wheel	Motor – hp (1 phase)	1/40			1/10		
	Potential – Volts	115			200–208/230V		
	Wheel Diameter – in	36			52–1/4		
	Wheel surface area – sq. ft. (m^2)	1000 (92.9)			1600 (148.6)		
	Wheel rotation	30 rpm					
	Motor Speed – rpm	600			600		
	Full Load Amps	0.95			1.1		
	Power Consumption – Watts	112			150		
Total Electrical Requirements	Minimum Circuit Ampacity	6.5	4	2.6	13.4	7.4	6.1
	Maximum Fuse Size – Amps	10	8	5	20	12	10

PERFORMANCE

Use this table to determine ventilation and size requirements. Table shows Lennox packaged units and matching ERW model. Air Flow Range, and Balanced Flow Effectiveness Range indicate what performance is possible.

ERW Wheel Type	Lennox Packaged Unit Model No.		Unit Size (Tons)	Matching ERW Model No.	Voltage & Phase	Catalog No.	Air Flow Range (cfm)		Balanced Flow Effectiveness Range (%)
							Energy Recovery Mode	Economizer/ Power Exhaust Mode	
Pivoting Wheel (For Packaged Units With Economizer)	CHA16 GCS16 CHP16 GHP16	-953	7.5	16ERWR95	208/230v–3ph	**33K01**	500 to 1500	Up to 3600	75 to 85
					460v–3ph	**33K02**			
					575v–3ph	**33K03**			
		-1353	10	16ERWR135	208/230v–3ph	**33K04**			
					460v–3ph	**33K05**			
					575v–3ph	**33K06**			
		-1603	12.5	16ERWR160	208/230v–3ph	**33K07**			
					460v–3ph	**33K08**			
					575v–3ph	**33K09**			
	CHA24 GCS24 CHP24 GHP24	-953	7.5	24ERWR95	208/230v–3ph	**33K10**			
					460v–3ph	**33K11**			
					575v–3ph	**33K12**			
		-1353	10	24ERWR135	208/230v–3ph	**33K13**			
					460v–3ph	**33K14**			
					575v–3ph	**33K15**			
		-1603	12.5	24ERWR160	208/230v–3ph	**33K16**			
					460v–3ph	**33K17**			
					575v–3ph	**33K18**			
	L Series	090 102 120 150	7.5 8.5 10 12	LAERWR09/15	208/230v–3ph	**33K19**			
					460v–3ph	**33K20**			
					575v–3ph	**33K21**			
		180 210 240	15 17.5 20	LAERWR18/24	208/230v–3ph	**62K90**	1500 to 3000	Up to 8600	75 to 83
					460v–3ph	**62K91**			
					575v–3ph	**62K92**			
Fixed Wheel (For Packaged Units Without Economizer)	CHA16 GCS16 CHP16 GHP16	-953	7.5	16ERWF95	208/230v–3ph	**33K22**	500 to 1500	- - - -	75 to 85
					460v–3ph	**33K23**			
					575v–3ph	**33K24**			
		-1353	10	16ERWF135	208/230v–3ph	**33K25**			
					460v–3ph	**33K26**			
					575v–3ph	**33K27**			
		-1603	12.5	16ERWF160	208/230v–3ph	**33K28**			
					460v–3ph	**33K29**			
					575v–3ph	**33K30**			
	CHA24 GCS24 CHP24 GHP24	-953	7.5	24ERWF95	208/230v–3ph	**33K31**			
					460v–3ph	**33K32**			
					575v–3ph	**33K33**			
		-1353	10	24ERWF135	208/230v–3ph	**33K34**			
					460v–3ph	**33K35**			
					575v–3ph	**33K36**			
		-1603	12.5	24ERWF160	208/230v–3ph	**33K37**			
					460v–3ph	**33K38**			
					575v–3ph	**33K39**			
	L Series	090 102 120 150	7.5 8.5 10 12	LAERWF09/15	208/230v–3ph	**33K40**			
					460v–3ph	**33K41**			
					575v–3ph	**33K42**			
		180 210 240	15 17.5 20	LAERWF18/24	208/230v–3ph	**62K93**	1500 to 3000	- - - -	75 to 83
					460v–3ph	**62K94**			
					575v–3ph	**62K95**			

UNBALANCED AIR FLOW CALCULATIONS

7.5 to 12.5 Ton

Wheel Effectiveness (Based on **Minimum** Air Flow Vs Flow Ratio)

Static Pressure		*Minimum Air Flow		Flow Ratio (R)										
in. w.g.	Pa	cfm	L/s	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
1.00	250	1500	710	0.76	0.77	0.78	0.79	0.81	0.82	0.83	0.85	0.86	0.87	0.88
0.90	225	1350	640	0.77	0.78	0.80	0.81	0.82	0.84	0.85	0.86	0.88	0.89	0.90
0.77	195	1150	545	0.79	0.80	0.81	0.83	0.84	0.85	0.86	0.87	0.89	0.90	0.91
0.67	170	1000	495	0.80	0.81	0.83	0.84	0.85	0.86	0.88	0.89	0.90	0.91	0.93
0.57	145	850	420	0.82	0.83	0.84	0.86	0.87	0.88	0.89	0.90	0.92	0.93	0.94
0.47	120	700	345	0.84	0.85	0.86	0.87	0.89	0.90	0.91	0.92	0.93	0.94	0.96
0.33	85	500	250	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.94	0.95	0.96	0.97

*Note: Minimum air flow equals lesser of supply or exhaust flows.

System Effectiveness (Based on **Minimum** Air Flow Vs Flow Ratio)

Static Pressure		*Minimum Air Flow		Flow Ratio (R)										
in. w.g.	Pa	cfm	L/s	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
1.00	250	1500	710	0.76	0.73	0.70	0.67	0.65	0.61	0.58	0.55	0.51	0.48	0.44
0.90	225	1350	640	0.77	0.75	0.72	0.69	0.66	0.63	0.59	0.56	0.53	0.49	0.45
0.77	195	1150	545	0.79	0.76	0.73	0.70	0.67	0.64	0.60	0.57	0.53	0.49	0.46
0.67	170	1000	495	0.80	0.77	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46
0.57	145	850	420	0.82	0.79	0.76	0.73	0.69	0.66	0.62	0.59	0.55	0.51	0.47
0.47	120	700	345	0.84	0.81	0.78	0.74	0.71	0.67	0.64	0.60	0.56	0.52	0.48
0.33	85	500	250	0.86	0.83	0.79	0.76	0.72	0.68	0.65	0.61	0.57	0.53	0.48

*Note: Values in this table are less than wheel effectiveness due to infiltration (higher exhaust air) or leakage (higher fresh air).

15 to 20 Ton

Wheel Effectiveness (Based on **Minimum** Air Flow Vs Flow Ratio)

Static Pressure		*Minimum Air Flow		Flow Ratio (R)										
in. w.g.	Pa	cfm	L/s	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
1.00	250	3000	710	0.75	0.76	0.77	0.78	0.79	0.80	0.81	0.82	0.84	0.84	0.85
0.90	225	2700	620	0.77	0.78	0.79	0.80	0.81	0.82	0.83	0.84	0.86	0.86	0.87
0.80	200	2400	565	0.78	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88
0.70	175	2100	495	0.80	0.81	0.82	0.83	0.84	0.85	0.86	0.87	0.89	0.89	0.90
0.60	150	1800	425	0.81	0.82	0.83	0.84	0.86	0.87	0.88	0.89	0.91	0.91	0.92
0.50	125	1500	355	0.83	0.85	0.86	0.88	0.90	0.91	0.92	0.93	0.94	0.94	0.95

*Note: Minimum air flow equals lesser of supply or exhaust flows.

System Effectiveness (Based on **Minimum** Air Flow Vs Flow Ratio)

Static Pressure		*Minimum Air Flow		Flow Ratio (R)										
in. w.g.	Pa	cfm	L/s	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
1.00	250	3000	710	0.75	0.72	0.69	0.66	0.63	0.60	0.57	0.53	0.50	0.46	0.43
0.90	225	2700	620	0.77	0.74	0.71	0.68	0.64	0.61	0.58	0.54	0.51	0.47	0.43
0.80	200	2400	565	0.78	0.75	0.72	0.69	0.66	0.62	0.59	0.55	0.52	0.48	0.44
0.70	175	2100	495	0.80	0.77	0.74	0.70	0.67	0.64	0.60	0.57	0.53	0.49	0.45
0.60	150	1800	425	0.81	0.78	0.75	0.72	0.68	0.65	0.61	0.58	0.55	0.50	0.46
0.50	125	1500	355	0.83	0.81	0.77	0.75	0.72	0.68	0.64	0.60	0.56	0.52	0.48

*Note: Values in this table are less than wheel effectiveness due to infiltration (higher exhaust air) or leakage (higher fresh air).

Example: Measure static pressure across top half of wheel, find air flow from table, repeat process on bottom half of wheel, ratio air volume values with larger on bottom. Finally match Flow Ratio (R) value and minimum air volume to determine wheel and system effectiveness.

Sample: 7.5 Ton Unit
Fresh air static pressure drop of 0.67 in. w.g. = 1000 cfm
Exhaust air static pressure drop of 1.0 in. w.g. = 1500 cfm

Flow Ratio (R) = $\frac{1000}{1500}$ = 0.667 and Minimum Air Flow = 1000 cfm

Interpolate to determine Wheel Effectiveness (Ewhl) and System Effectiveness (Esys)

Ewhl=(R–R1) $\times$ (E2–E1)/(R2–R1)+E1 = (0.667–0.65) $\times$ (0.88–0.89)/(0.70–0.65)+0.89 = 0.88

Esys=(R–R1) $\times$ (E2–E1)/(R2–R1)+E1 = (0.667–0.65) $\times$ (0.61–0.58)/(0.70–0.65)+0.58 = 0.59

Result: Wheel Effectiveness – 88%, System Effectiveness – 59%.

ERW BLOWER PERFORMANCE

Use Blower Performance Tables to determine total power requirements, added cooling load, and reduced heating load due to motor. Air flow can be determined by measuring pressure drop across recovery wheel (provided). The economizer should be at minimum position. Altering economizer minimum position will affect loading of supply and exhaust blowers. Select sheave rotation and RPM range to obtain desired flow rate with the lowest power consumption of the system. If pressure drop is inadequate, minimum economizer has added additional external static to system and a higher RPM range must be used. Enthalpy wheel power requirements can be found in Specifications and Electrical Data. Use Unbalanced Air Flow Data to determine wheel and system effectiveness.

Example: 7.5 Ton Unit, 750 cfm Supply Air @ 798 RPM, 1500 Exhaust Air @ 960 RPM

Total Power Requirements:

= Supply Blower + Exhaust Blower + Enthalpy Wheel

= 0.282 kW + 0.509 kW + 0.112 kW = 0.903 kW

Added Cooling Load:

$= 3{,}412 \frac{\text{Btuh}}{\text{kW}}$ (Supply Blower+Enthalpy Wheel)

$= 3{,}412 \frac{\text{Btuh}}{\text{kW}}$ (0.282+0.112 kW) = 1344 Btuh/Hr

Reduced Heating Load:

$= -3{,}412 \frac{\text{Btuh}}{\text{kW}}$ (Supply Blower+Enthalpy Wheel)

$= -3{,}412 \frac{\text{Btuh}}{\text{kW}}$ (0.282+0.112 kW) = –1344 Btuh/Hr

7.5 to 12.5 Ton Air Flow (Recovery Mode)

Air Flow cfm (L/s)	Wheel Differential Pressure in. w.g. (Pa)	Sheave Rotation											
		Closed		1 Turn		2 Turns		3 Turns		4 Turns		5 Turns	
		RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
600 (283)	0.40 (100)	966	0.396 (.296)	923	0.385 (.288)	880	0.375 (.279)	837	0.364 (.271)	799	0.351 (.262)	761	0.338 (.252)
675 (319)	0.45 (113)	966	0.414 (.309)	923	0.402 (.300)	880	0.391 (.292)	837	0.380 (.283)	799	0.364 (.271)	761	0.348 (.260)
750 (354)	0.50 (125)	965	0.432 (.323)	922	0.420 (.314)	879	0.409 (.305)	837	0.397 (.296)	798	0.378 (.282)	760	0.360 (.268)
825 (390)	0.55 (138)	964	0.452 (.337)	922	0.440 (.328)	879	0.427 (.319)	836	0.414 (.309)	798	0.394 (.294)	760	0.374 (.279)
900 (425)	0.60 (150)	964	0.474 (.353)	921	0.460 (.343)	879	0.446 (.333)	836	0.433 (.323)	798	0.411 (.306)	760	0.389 (.290)
975 (460)	0.65 (163)	963	0.496 (.370)	921	0.481 (.359)	878	0.466 (.348)	836	0.452 (.337)	798	0.429 (.320)	----	----
1050 (496)	0.70 (175)	963	0.519 (.388)	920	0.503 (.376)	878	0.487 (.364)	836	0.471 (.352)	798	0.448 (.334)	----	----
1125 (531)	0.75 (188)	962	0.544 (.406)	920	0.526 (.393)	878	0.509 (.380)	835	0.491 (.367)	----	----	----	----
1200 (567)	0.80 (200)	961	0.570 (.425)	919	0.551 (.411)	877	0.531 (.396)	----	----	----	----	----	----
1275 (602)	0.85 (213)	961	0.596 (.445)	919	0.575 (.429)	877	0.554 (.414)	----	----	----	----	----	----
1350 (638)	0.90 (225)	960	0.624 (.466)	918	0.601 (.448)	----	----	----	----	----	----	----	----
1425 (673)	0.95 (238)	960	0.652 (.487)	918	0.627 (.468)	----	----	----	----	----	----	----	----
1500 (708)	1.00 (250)	960	0.682 (.509)	917	0.654 (.488)	----	----	----	----	----	----	----	----

15 to 20 Ton Air Flow (Recovery Mode)

Air Flow cfm (L/S)	Wheel Differential Pressure in. w.g. (Pa)	Sheave Rotation											
		Closed		1 Turn		2 Turns		3 Turns		4 Turns		5 Turns	
		RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
1500 (355)	0.50 (125)	770	1.368 (1.020)	735	1.310 (.977)	700	1.277 (.953)	665	1.245 (.928)	630	1.210 (.903)	595	1.160 (.865)
1650 (390)	0.55 (138)	769	1.422 (1.061)	734	1.363 (1.016)	699	1.328 (.991)	664	1.294 (.965)	629	1.259 (.939)	594	1.206 (.899)
1800 (425)	0.60 (150)	769	1.479 (1.103)	734	1.417 (1.057)	699	1.382 (1.030)	664	1.346 (1.004)	629	1.309 (.976)	594	1.254 (.935)
1950 (460)	0.65 (163)	768	1.524 (1.136)	733	1.460 (1.089)	698	1.423 (1.061)	663	1.386 (1.034)	628	1.348 (1.006)	----	----
2100 (495)	0.70 (175)	767	1.569 (1.170)	732	1.503 (1.121)	697	1.466 (1.093)	662	1.428 (1.065)	627	1.389 (1.036)	----	----
2250 (530)	0.75 (188)	767	1.601 (1.194)	732	1.533 (1.144)	697	1.495 (1.115)	662	1.457 (1.086)	----	----	----	----
2400 (565)	0.80 (200)	766	1.633 (1.218)	731	1.564 (1.167)	696	1.525 (1.137)	----	----	----	----	----	----
2550 (600)	0.85 (213)	765	1.649 (1.230)	730	1.580 (1.178)	695	1.555 (1.160)	----	----	----	----	----	----
2700 (640)	0.90 (225)	765	1.666 (1.242)	730	1.596 (1.190)	----	----	----	----	----	----	----	----
2850 (675)	0.95 (238)	764	1.682 (1.255)	729	1.612 (1.202)	----	----	----	----	----	----	----	----
3000 (710)	1.00 (250)	763	1.699 (1.267)	728	1.628 (1.214)	----	----	----	----	----	----	----	----

ERW POWER EXHAUST PERFORMANCE

7.5 to 12.5 Tons (ERW Wheel Out Of Air Stream, Supply Air Blower Off)

Return Air System Static Pressure		Sheave Rotation											
		Closed		1 Turn		2 Turns		3 Turns		4 Turns		5 Turns	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0.00	0	3600	1700	3420	1613	3240	1528	3060	1443	2732	1288	2403	1134
0.10	25	3528	1664	3352	1581	3175	1498	2999	1415	2677	1263	2355	1111
0.20	50	3456	1630	3283	1549	3110	1467	2938	1386	2622	1237	2307	1088
0.30	75	3345	1578	3178	1499	3011	1420	2843	1341	2538	1197	2233	1053
0.40	100	3195	1507	3035	1432	2876	1356	2716	1281	2424	1144	2133	1006
0.50	125	3045	1436	2893	1365	2741	1293	2588	1221	2310	1090	2033	959

15 to 20 Tons (50%)

Return Air System Static Pressure		Sheave Rotation											
		Closed		1 Turn		2 Turns		3 Turns		4 Turns		5 Turns	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0.00	0	4300	2028	4105	1936	3910	1844	3715	1752	3547	1673	3379	1594
0.10	25	4210	1986	4015	1894	3820	1802	3637	1716	3469	1636	3301	1557
0.20	50	4070	1920	3875	1828	3680	1736	3516	1659	3348	1579	3180	1500
0.30	75	3930	1854	3735	1762	3540	1670	3396	1602	3227	1522	3059	1443
0.40	100	3780	1783	3585	1691	3390	1599	3266	1541	3098	1461	2929	1382
0.50	125	3600	1698	3405	1606	3210	1514	3110	1467	2942	1388	2774	1308

15 to 20 Tons (100%)

Return Air System Static Pressure		Sheave Rotation											
		Closed		1 Turn		2 Turns		3 Turns		4 Turns		5 Turns	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0.00	0	8600	4057	8210	3873	7820	3689	7430	3505	7094	3346	6757	3187
0.10	25	8420	3972	8030	3788	7640	3604	7275	3432	6938	3273	6602	3114
0.20	50	8140	3840	7750	3656	7360	3472	7033	3317	6696	3159	6360	3000
0.30	75	7860	3708	7470	3524	7080	3340	6791	3203	6454	3045	6118	2886
0.40	100	7560	3566	7170	3382	6780	3198	6532	3081	6195	2922	5859	2763
0.50	125	7200	3396	6810	3212	6420	3028	6221	2934	5884	2776	5547	2617

OPTIONAL ACCESSORIES

ERW Support – 8 in. (203 mm) high base for exhaust and intake end of unit. Support is installed into the roof similar to a roof frame. Provides the best support for new installations.

Unit	Catalog No.
16/24 Series	
–953,–1353,–1603	**64K61**
L Series	
090, 102, 120, 150	**64K61**
180, 210, 240	**64K62**

Roof Mounting Frame – A 20 or 26 in. (508 or 660 mm) roof mounting frame is required to match supply and exhaust openings of the ERW with 16 and 24 series units in new applications.

Unit	Height	Catalog No.
16/24 Series		
–953	26 (660)	**64K63**
–1353	20 (508)	**64K64**
–1603	20 (508)	**64K65**
L Series		
090, 102, 120, 150	20 (508)	**64K66**
180, 210, 240	20 (508)	**64K67**

Roof Mounting Frame Extension – For retrofit applications where it is desirable to raise the ERW height to match an existing roof mounting frame.

Unit	Catalog No.
16/24 Series	
–953	**64K68**
–1353	**64K69**
–1603	**64K70**

Duct Transition – For retrofit applications when new roof frame or frame extension will not match rooftop unit and ERW. Required to correctly match supply and exhaust air openings when ERW is extended away from rooftop unit. Not required for L series.

Unit	Catalog No.
16 Series	
–953	**64K71**
–1353	**64K72**
–1603	**64K73**
24 Series	
–953	**64K74**
–1353	**64K75**
–1603	**64K76**

Low Ambient Control (64K77) – Prevents frost formation on energy wheel heat transfer surfaces by terminating recovery wheel operation when ambient temperature falls to a minimum of 10°F (–12.2°C). Temperature setting is field adjustable. Recovery wheel operation resumes operation after temperature rises 10°F (5.5°C) above set–point temperature.

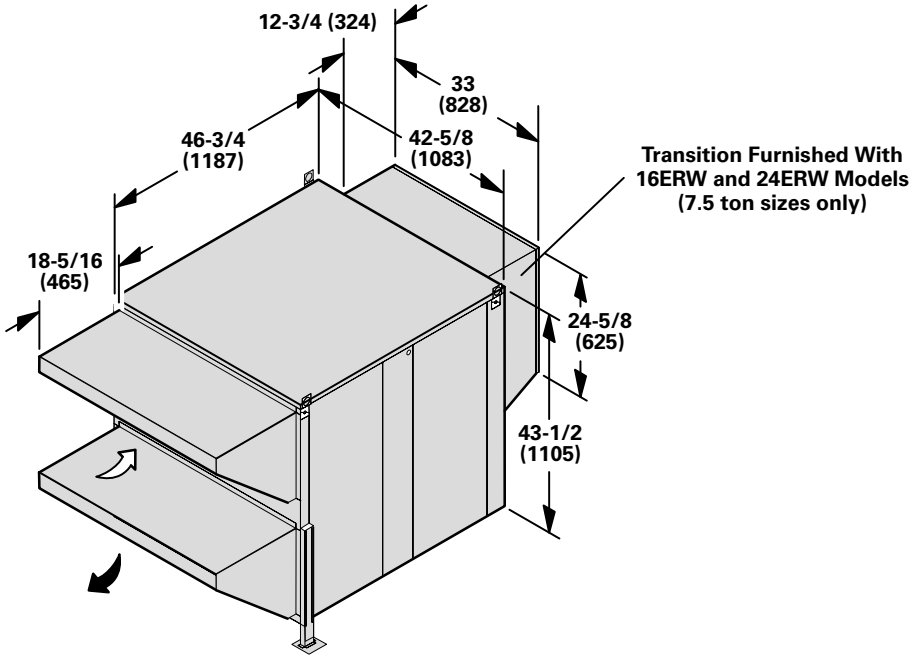
SERVICE CLEARANCES

– A minimum of 36 in. (914 mm) clearance is required for unit servicing. Periodic cleaning of filters and energy transfer surfaces may be required.

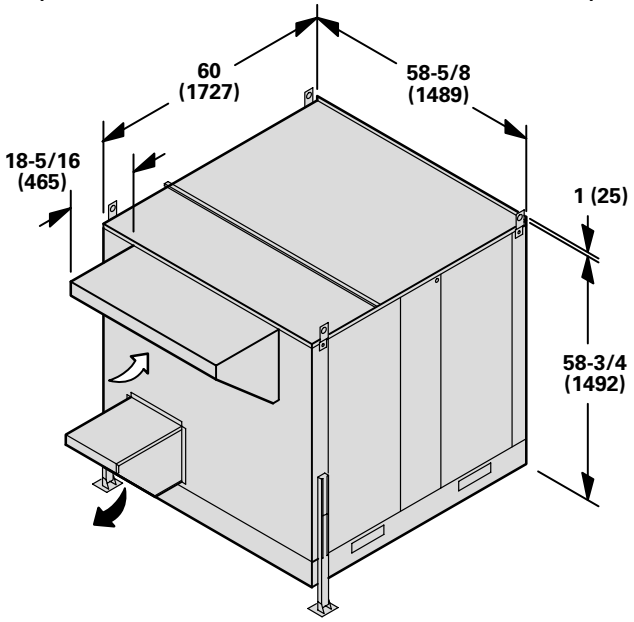
– Inlet and supply openings should be positioned away from all sources of contaminants including flue gases from adjacent roof equipment. Refer to local building codes for minimum distance requirements.

DIMENSIONS – inches (mm)

16ERW AND 24ERW ENERGY RECOVERY WHEEL MODELS
(For 16/24 Series 7.5 Thru 12.5 Ton Units)
LAERW09/15 ENERGY RECOVERY WHEEL
(For L Series 7.5 Thru 12 Ton Units)



LAERW18/24 ENERGY RECOVERY WHEEL
(For L Series 15 Thru 20 Ton Units – Fixed Wheel)



LAERW18/24 ENERGY RECOVERY WHEEL
(For L Series 15 Thru 20 Ton Units – Pivoting Wheel)