ENERGY RECOVERY SYSTEM FOR L-SERIES® ROOFTOP UNITS - 60 HZ

PRODUCT SPECIFICATIONS

Bulletin No. 210533
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Supersedes October 2010

2800 to 6200 cfm Capacity

MODEL NUMBER IDENTIFICATION

50 R 36 33 x H 23 Factory Options (See below)

Manufacturer Code
50 = Lennox

Wheel Design
R = Fixed
P = Pivoting

Air Flow Range
36 = 2800-3600 cfm
46 = 3400-4600 cfm
62 = 4800-6200 cfm

Matching L Series Unit
33 = LCA/LGA248, LCC/LGC300H, 360

Design Series
X = First Generation

Blower Speed
H = High
M = Medium

Voltage
23 = 208/230V - 3 phase - 60hz
33 = 460V - 3 phase - 60hz
43 = 575V - 3 phase - 60hz

Factory Option Codes

L M E S P R D V F F H E

L = Low Ambient Kit
M = Motorized Outside Air Damper
E = Motorized Exhaust Air Damper
S = Stop-Start-Jog (Only On Fixed Wheel)
P = Pressure Sensor
R = Rotation Sensor
D = Disconnect

VFD Available Options
V = Non PID - Intake & Exhaust Blowers
T = Non PID - Wheel Only
B = Non PID - Both Blowers & Wheel
U = PID - Intake & Exhaust
Y = PID - Wheel Only
Z = PID - Both Blowers & Wheel

Dirty Filter Sensor Location
F = Fresh Air Intake
E = Exhaust Air
A = Fresh & Exhaust Air
(Not Used With "M" Option)

Filter Rack
F = Fresh Air Intake
E = Exhaust Air
A = Fresh & Exhaust Air
(Not Used With "M" Option)

H = Hinged Doors with Handles
(must be factory approved)

Wheel Type
E = Enthalpy
S = Sensible

Notes:
*x = Factory Option Not Selected e.g. 50R3633xH23L**x**ES**x**RD**x**BE**xx**E*
ERS is a Fixed wheel with 2800-3600 cfm for the LGC/LCC300H-360 Unit with a Low Ambient Kit, Motorized Exhaust Air Damper, Stop-Start Jog, Rotation Sensor, Disconnect, VFD - Non PID, Dirty Filter Sensor in Exhaust Air and an Enthalpy Wheel.

CONTENTS

APPROVALS

Rated in accordance with AHRI standard 1060-2005. To obtain a copy of the Standard or to view Lennox' latest certified data, please visit the AHRI website at http://www.ahrinet.org/.

ETL Certified per UL 1995 and CSA/CAN C22.2 No. 236.

WARRANTY

Recovery Wheel - limited warranty for five years.

All other covered components - one year limited warranty.

APPLICATIONS

The Lennox Energy Recovery System (ERS) is a constant volume, energy recovery ventilator that is directly coupled with Lennox L Series® rooftop units. Its primary function is to increase overall HVAC system efficiency and to reduce long-term energy costs.

This is accomplished by capturing both sensible and latent energy from either the exhaust or intake air stream and transferring it to the other, resulting in reduced cooling loads at design temperatures up to four tons per 1000 cfm of outside air and reduced heating loads up to 12,000 Btuh per 400 cfm of outside air.

The recovery wheel provides sensible and latent energy exchange between the entering and exhaust air streams of a building allowing a substantial amount of the energy, which is normally lost in the exhaust air stream, to be returned into the entering air.

Each unit factory test operated to ensure proper operation.

OPERATION

The enthalpy wheel contains parallel layers of a polymeric material that is physically imbedded with a silica gel (desiccant).

The wheel is located in the intake and exhaust air streams of the ventilation equipment.

As the wheel rotates through each air stream, the wheel surface captures sensible and latent energy.

In the heating mode, the wheel rotates to provide a constant transfer of heat from the exhaust air stream to the colder intake air stream. During the cooling season, the process is reversed.

When used in conjunction with a rooftop unit equipped with an economizer, on pivoting models, the wheel pivots out of the air stream to allow the economizer to operate normally for "free cooling" when outdoor temperature and humidity is acceptable.

By pivoting the wheel out of the air stream, the system can utilize 100% of the rooftop unit's blower capabilities. During economizer operation, the exhaust blower continues to run, providing power exhaust for the system. The intake blower is de-energized during economizer operation.

ERS SELECTION

Step One - Determine the air conditioning load requirements using the required amount of outside air without an ERS.

Step Two - Select the proper ERS for the outside air requirements and calculate the tonnage reduction.

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

Select the proper ERS based on the selected unit.

NOTE - The height of the roof top unit curb MUST correspond with the required curb height needed for the ERS. See Specifications Table.

SYSTEM FEATURES

Low-voltage logic board used to control frost protection and motorized outside air damper.

Low-voltage terminal strip.

Barometric relief dampers provided standard on all ERS units.

Balancing dampers provided standard on all fixed wheel ERS units.

Metal-mesh, mist-eliminator-type filters provided in intake air hood.

Separate, fused power supply.

Continuous operation down to 10°F without defrost at indoor relative humidity up to 40%. For temperatures below 10°F an optional, factory installed Low Ambient Control Kit is required.

FEATURES

RECOVERY WHEEL

AirXchange Enthalpy Wheels. Capable of both sensible and latent heat recovery. Dry energy transfer. Moisture in supply air stream is transferred to exhaust air stream in vapor state, eliminating condensate plumbing in the ventilator.

Constructed of lightweight polymer material and coated with a desiccant silica gel that will not dissolve or liquify in the presence of water or high humidity.

Wheels 25 in. and larger in diameter are segmented for easy removal. Wheels less than 25 in. in diameter are removed from cabinet in a slide-out cassette.

Patented, pivoting-wheel option allows unit to operate in true economizer mode when the outside temperature is suitable for cooling. Pivoting the wheel out of the air stream during economizer mode allows efficiencies to be maximized by reducing demand on the supply fan motor.

BLOWERS

Centrifugal, forward curved blowers provided for high-static capability and low sound levels.

Belt-drive blowers have permanently lubricated ball bearings, overload protection, and adjustable sheaves for blower speed adjustment.

CABINET

Fully insulated with non-hygroscopic fiberglass insulation. Constructed of galvanized steel and finished with electrostatically bonded powdered enamel coating to withstand 1000 hour salt-spray test per ASTM B117.

Attaches directly to the rooftop unit. All mounting hardware is provided.

Adjustable support legs are provided.

OPTIONS / ACCESSORIES

Factory Installed

Low Ambient Control Kit

Prevents frost formation on energy wheel heat transfer surfaces by terminating the intake blower operation when discharge air temperature falls below a field-selectable temperature setting.

Intake blower operation resumes after temperature rises above the adjustable temperature differential. Kit includes temperature sensor.

Motorized Outside Air Damper

Damper mounts behind the outside air intake hood. Damper opens when the ERS is energized and closes when de-energized.

Motorized Exhaust Air Damper

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

Stop-Start-Jog (Fixed Models Only)

Control option that allows intermittent operation of the enthalpy wheel during mild outdoor conditions to provide cycling and cleaning of the wheel.

Pressure Sensor

Measures the amount of outside airflow across the enthalpy wheel.

Rotation Sensor

Verifies the rotation of the enthalpy wheel.

Disconnect

Optional field device used to provide easy ability to switching the power on and off to the ERS. Must be field wired.

VFD Blower Control

Variable frequency drives are available to control the speed of the blowers only. These VFD's can be integrated with a building automation system to deliver precisely the amount of air needed to maximize efficiencies.

Dirty Filter Sensor

The dirty filter sensor sends a signal to field wired alarm when filters need to be cleaned or changed.

Filter Rack

Filter racks filter air in both the intake and exhaust sections of ERS.

Hinged Door with Handles

Hinged panel access doors with quarter turn latches that allow for easy access to the energy recovery wheel, filters and blowers.

Energy Recovery Wheel - Sensible Type

Sensible Wheel type is used for sensible heat recovery.

Field Installed

ERS Support

8 inch high base for support of the exhaust and intake end of the ERS.

Available in 60, and 76 inch lengths.

ERS Roof Curb

Used to support RTU and raise them to the correct height for mounting.

GFI Service Outlet

Optional field powered service outlet provides power for service equipment. Must be field installed and wired.

See page 4 for models numbers.

NOTE - Contact your local Lennox Commercial Sales Representative for ordering information.

OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

Model No.		50R3633xH	50R4633xH	50R6233xM 50R6233xH
	Fixed Wheel			
	Pivot Wheel	50P3633xH	50P4633xH	50P6233xM 50P6233xH
Dirty Filter Sensor		O	O	O
[2] Disconnect		O	O	O
Energy Recovery Wheel - Sensible		O	O	O
Filter Rack		O	O	O
[2] GFI Service Outlet		X	X	X
Hinged Door With Handles		O	O	O
Low Ambient Kit		O	O	O
Motorized Exhaust Air Damper Kit		O	O	O
Motorized Outdoor Air Damper Kit		O	O	O
Pressure Sensor Kit		O	O	O
[1]Stop-Start-Jog Kit		O	O	O
Roof Curb	502013214	X		
Equipment Support	012106008	X	X	X
	012107608		X	X
Rotation Sensor		O	O	O
VFD		O	O	O

O - Configure to Order (Factory Installed)
X - Field Installed.
[1] Available on Fixed Wheel models only.
[2] Must be Field Wired

ELECTRICAL DATA - 60HZ

Model No.		50R3633XH	50P3633xH	50R4633xH	50P4633xH	50R6233xM 50R6233xH	50P6233xM 50P6233xH
Fresh Air Blower Motor Full load amps	208/230V-3ph	7	7	9	9	15	15
	460V-3ph	3.5	3.5	4.4	4.4	7.4	7.4
	575V-3ph	2.4	2.4	3.6	3.6	5.9	5.9
Exhaust Blower Motor Full load amps	208/230V-3ph	7	9.4	9	15.3	15.3	15.3
	460V-3ph	3.5	4.3	4.3	6.4	6.4	6.4
	575V-3ph	2.4	3.2	3.4	5.1	5.1	5.1
Wheel Drive Motor - Full load amps		1.2	1.2	1.2	1.2	1.2	1.2
Maximum Overcurrent Protection (amps)	208/230V-3ph	25	25	30	40	50	50
	460V-3ph	12	15	15	20	25	25
	575V-3ph	10	12	12	15	20	20
[1]Minimum Circuit Ampacity	208/230V-3ph	17	20	21.5	29.4	35.4	35.4
	460V-3ph	9	10	11	13.6	16.9	16.9
	575V-3ph	6.6	7.6	9.1	11.2	13.7	13.7

[1]Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.
[2]A unit step-down transformer is provided, 208/230/460/575V primary, 120V secondary.

SPECIFICATIONS - FOR 21, 25 AND 30 TON L SERIES UNITS

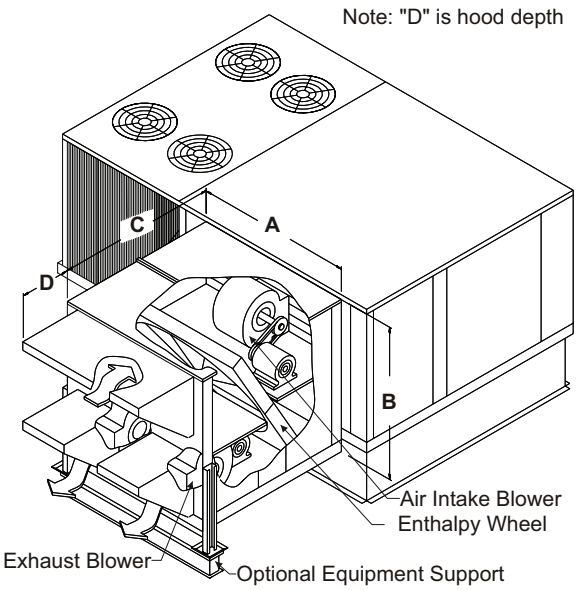
General Data		**Model Number Fixed Wheel**	**50R3633xH**			**50R4633xH**			**50R6233xM**			**50R6233xH**	
		Model Number Pivoting Wheel	**50P3633xH**			**50P4633xH**			**50P6233xM**			**50P6233xH**	
		Nominal Air Volume - cfm	2800-3600			3400-4600			4800-5600			5500-6200	
		Matching Units	L Series 248, 300H and 360 models										
Required Height of Rooftop Unit Curb - in.			14			14			14			14	
Fresh Air Blower		Belt-Drive Motor - hp	2			3			5			5	
		Wheel Size (diameter x width) - in	12 x 9			12 x 12			12 x 12			12 x 12	
		Motor Speed - rpm	1725			1725			1725			1725	
		Motor Speed(s)	Adjustable Sheave										
		Bearing Type	Ball										
Exhaust Air Blower	Belt-Drive Motor - hp	Fixed Wheel	2			3			5			5	
		Pivoting Wheel	3			5			2 each - 5			2 each - 5	
		Wheel Size (diameter x width) - in	12 x 9			12 x 12			12 x 12			12 x 12	
		Motor Speed - rpm	1725			1725			1725			1725	
		Motor Speed(s)	Adjustable Sheave										
		Bearing Type	Ball										
Recovery Wheel		Wheel Depth x Diameter - in	3 x 41-13/16			3 x 46-3/4			3 x 52			3 x 52	
		Motor Speed - rpm	1075			1075			1075			1075	
Electrical Data - Line Voltage - 60hz			208/230V-3ph, 460V-3ph, or 575V-3ph										
Enthalpy Wheel Airflow Data		Nominal Airflow	3100 cfm at 0.9 in. w.c.			3900 cfm at 0.95 in. w.c.			5500 cfm at 0.95 in. w.c.			5500 cfm at 0.95 in. w.c.	
	EATR - Exhaust Air Transfer Ratio	at minus 1 in. w. c.	4.90%			4.40%			4.00%			4.00%	
		at 0 in. w.c.	1.30%			1.10%			1.00%			1.00%	
		at 1 in. w.c.	0.30%			0.20%			0.20%			0.20%	
	OACF - Outdoor Air Correction Factor	at minus 1 in. w. c.	0.99%			0.99%			0.99%			0.99%	
		at 0 in. w.c.	1.07%			1.06%			1.06%			1.06%	
		at 1 in. w.c.	1.12%			1.11%			1.10%			1.11%	
[1]Thermal Ratings at 0 in. w.c. Pressure Differential			Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
	Total Effectiveness	100% Airflow Heating	68%	61%	65%	68%	60%	65%	68%	60%	65%	68%	60%	65%
		75% Airflow Heating	72%	67%	71%	73%	67%	71%	73%	67%	71%	73%	67%	71%
		100% Airflow Cooling	68%	61%	64%	68%	60%	63%	68%	60%	63%	68%	60%	63%
		75% Airflow Cooling	72%	67%	70%	73%	67%	70%	73%	67%	70%	73%	67%	70%
	Net Effectiveness	100% Airflow Heating	68%	61%	65%	68%	60%	65%	68%	60%	65%	68%	60%	65%
		75% Airflow Heating	72%	67%	71%	73%	67%	71%	73%	67%	71%	73%	67%	71%
		100% Airflow Cooling	68%	61%	64%	68%	60%	63%	68%	60%	63%	68%	60%	63%
		75% Airflow Cooling	72%	67%	70%	73%	67%	70%	73%	67%	70%	73%	67%	70%
[2] Weights	Fixed	Shipping Weight - lbs.	1120			1333			1566			1566	
		Net Weight - lbs.	1045			1224			1441			1441	
	Pivoting	Shipping Weight - lbs.	1125			1339			1623			1623	
		Net Weight - lbs.	1050			1230			1498			1498	

[1] Rated in accordance with AHRI Standard 1060-2005. For further information, please reference AHRI 1060-2005 Standard for Rating Air-to-Air Heat Exchangers For Energy Recovery Ventilation Equipment.

[3] Actual weight may vary and is dependent on configuration.

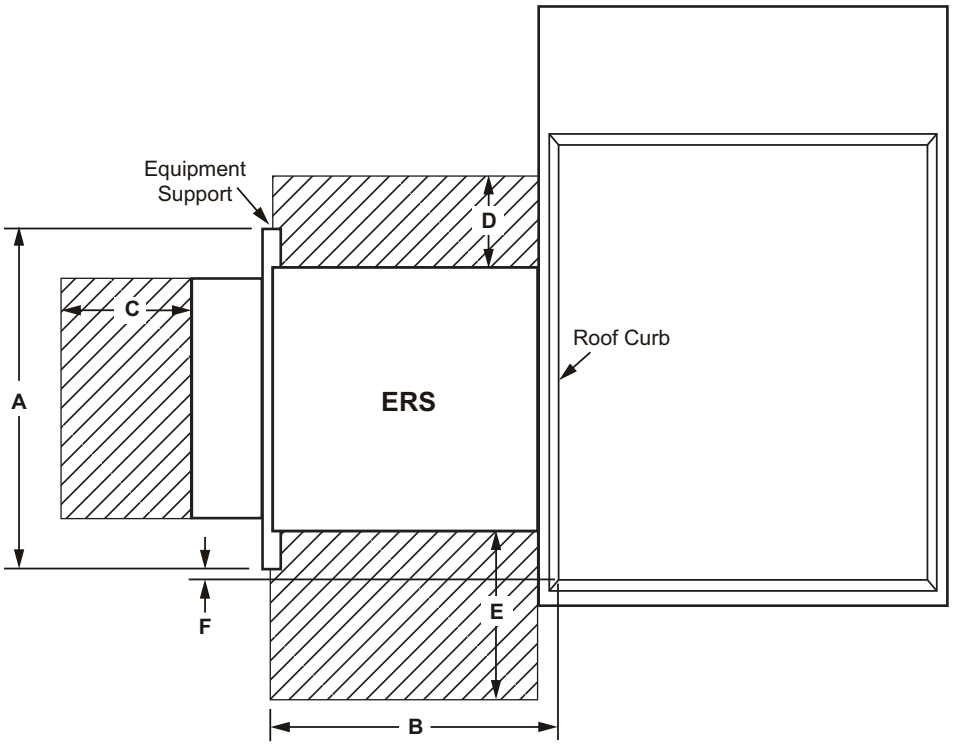
DIMENSIONS - INCHES (MM)

Model No.	A	B	C	D
50R3633xH 50P3633xH	46-11/16 (1186)	57-3/8 (1457)	60 (1524)	18-5/16 (465)
50R4633xH 50P4633xH	52-11/16 (1338)	57-3/8 (1457)	60 (1524)	18-5/16 (465)
50R6233xM 50R6233xH 50P6233xM 50P6233xH	58-7/8 (1496)	57-3/8 (1457)	60 (1524)	18-5/16 (465)



UNIT CLEARANCES - INCHES (MM)

LCA/LGA248, 300H, 360



ERS Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
50R3633xH 50P3633xH	60	1524	63-7/8	1622	36	914	30	762	60	1524	11-1/4	286
50R4633xH 50P4633xH	76	1930	63-7/8	1622	36	914	30	762	60	1524	3-1/8	79
50R6233xM 50R6233xH 50P6233xM 50P6233xH	76	1930	63-7/8	1622	36	914	30	762	60	1524	3-1/8	79

GUIDE SPECIFICATIONS

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

General

- *Unit shall be a constant volume, energy recovery system used in conjunction with packaged rooftop equipment.*
- *Unit shall be directly coupled to the rooftop packaged unit to form a unitized system.*
- *Unit shall be performance rated in accordance with AHRI standards and in compliance with ASHRAE or DOE standards.*
- *Unit shall be certified to the applicable safety standards for the installed country.*
- *In addition, manufacturer shall test operate system at the factory before shipment.*

Approval

- *All models shall be certified in accordance with AHRI Standard 1060-2005, Air-to-Air Energy Recovery Ventilation Equipment and Standard for Safety for Heating and Cooling Equipment ANSI/UL1995, CAN CSA - 22.2 No. 236-05*

Equipment Warranty

- *Energy Recovery wheel shall have a limited warranty for five years.*
- *All other covered components have a limited warranty for one year.*

Cabinet

- *Shall be designed to attach directly to the rooftop unit.*
- *Shall be constructed of G90 galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal.*
- *Metal shall be salt spray tested for 1000 hours per ASTM B-117.*
- *Cabinet panels shall be fully insulated with non-hygroscopic fiberglass insulation. Insulation shall have an R-Value of 3. 7 and shall be flame resistant per UL-723. Insulation shall be in accordance with NFPA 90A and tested to meet UL 181 erosion requirements.*
- *Full perimeter base rail with top mounted rigging holes and fork truck access from three sides shall be provided.*
- *Test ports shall be provided so airflow can be measured across the energy recovery wheel.*

Energy Recovery Wheel

- *Standard wheel shall be the enthalpy type for both sensible and latent heat recovery.*
- *Energy transfer ratings shall be certified in accordance with AHRI Standard 1060-2000.*
- *Wheel shall be constructed of a lightweight polymer material.*
- *Enthalpy type shall be coated with a desiccant silica gel that will not dissolve or liquify in the presence of water or high humidity.*
- *All energy recovery wheels shall be designed to be removed from the unit for ease of inspection and maintenance, 25 inch and larger wheels shall be segmented for easy removal.*
- *The wheel shall be easily cleanable with standard coil cleaning solution.*
- *The wheel shall be available in both fixed and pivoting configurations.*

Performance

- *The complete line of units shall have a cfm range of 2800 to 6200.*
- *Individual units shall be available in ranges of 2800-3600, 3400-4600, 4800-5600, and 5500-6200 cfm.*
- *Unit shall operate to 10°F without the need for frost protection.*
- *Unit shall have up to 73% net effectiveness per AHRI tests. Application effectiveness shall be higher.*

Control Operation

- *Operation shall be controlled by a low voltage logic board.*
- *Logic board shall control low ambient kit and motorized outside air damper.*

Access Doors

- *All components shall be accessible through removable access doors as a standard option.*

Filters

- *All unit shall be provided with mist eliminator type filters in the intake air hood.*

Blowers

- *Intake/exhaust air blowers shall be direct drive on ERS of 1000 cfm or less.*
- *Belt drive intake/exhaust air blowers shall be used on ERS over 1000 cfm.*

Motors

- *Blower motors on belt drive ERS shall have permanently lubricated ball bearings. Motors shall have thermal overload protection and shall have adjustable sheaves for blower speed adjustment.*
- *Blower motors on direct drive ERS shall be PSC type with multiple speeds.*
- *Intake and exhaust motors shall be individually controlled.*
- *Motor efficiency shall meet requirements of U.S. Energy Policy Act of 1992 (EPACT).*

Electrical

- *Units shall have single power point connection.*
- *A low voltage terminal strip shall be available.*

Balancing Dampers

- *Shall be provided for all fixed wheel units and shall be mounted inside the rooftop unit.*

Barometric Relief Dampers

- *Pressure operated dampers shall be provided for all ERS units.*

OPTIONAL ACCESSORIES

Low Ambient Kit

- *Low Ambient Kit shall be factory installed to prevent frost formation on the energy recovery wheel.*
- *Frost is prevented controlling the intake blower operation when discharge temperature is below a selectable temperature setting.*

GUIDE SPECIFICATIONS

Motorized Outside Air Damper Assembly with Hood

- *Shall be factory installed to provide motorized operation of intake air requirements.*
- *Damper assembly shall be installed behind the ERS outside air intake hood.*

Motorized Exhaust Air Damper

- *Shall be factory installed to provide motorized operation of exhaust air requirements.*
- *Damper assembly shall be install in the ERS barometric relief hood.*

Stop-Start-Jog

- *Shall be a factory installed option for fixed wheel units only. Matching rooftop unit should not have an economizer.*

Pressure Sensor

- *Shall be a factory installed option to provide the amount of outside airflow across the enthalpy wheel.*

Rotation Sensor

- *Shall be a factory installed option to verifies the rotation of the enthalpy wheel.*

Disconnect

- *Shall be factory installed and field wired to provide easy abiltiy to turn power on/off to the ERS*

VFD

- *Shall be factory installed to provide variable frequency drive to control the speed of the blowers only.*

Dirty Filter Sensor

- *Shall be factory installed to provide a sensor to signal a field installed alarm when the filters need to be cleaned or changed.*

Filter Rack

- *Shall be factory installed with 2" MERV 8 pleated filters to filter air in both the intake and exhaust sections of the ERS.*

Hinged Doors with Handles

- *Shall be factory installed to provide easy access to the energy recovery wheel, filters and blowers.*

Optional Energy Recovery Wheel

- *Optional wheel shall be the sensible type for sensible heat recovery.*
- *Energy transfer ratings shall be certified in accordance with AHRI Standard 1060-2000.*
- *Wheel shall be constructed of a lightweight polymer material.*
- *All energy recovery wheels shall be designed to be removed from the unit for ease of inspection and maintenance, 25 inch and larger wheels shall be segmented for easy removal.*
- *The wheel shall be easily cleanable with standard coil cleaning solution.*
- *The wheel shall be available in both fixed and pivoting configurations.*

GFI Service Outlet

- *Shall be field installed and field wired to provide powered*

service outlet.

ERS Equipment Support

- *Shall be field installed to provide support of the exhaust and intake end of the ERS.*
- *Support are available in 60, and 76 inch lengths.*

ERS Roof Curb

- *Shall be field installed to provide support of the RTU and raise them to the correct height for mounting.*

REVISIONS

Sections	Description of Change
Document	Miscellaneous corrections.

AHRI CERTIFIED™ www.ahridirectory.org
Air-to-Air ERV
AHRI Standard 1060
Energy Recovery COMPONENT is certified. Actual performance in packaged equipment may vary.

C ETL CM US LISTED Intertek

LENNOX®

Visit us at www.lennox.com

For the latest technical information, www.lennoxcommercial.com

Contact us at 1-800-4-LENNOX

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.
Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.
Installation and service must be performed by a qualified installer and servicing agency.