



L SERIES KITS AND ACCESSORIES

R06A-30LDW
506350-01 (Replaces 504,714M)
June 19, 2009
Supercedes 10-01-03

50R0630xH ENERGY RECOVERY SYSTEM

INSTALLATION INSTRUCTIONS FOR ENERGY RECOVERY SYSTEMS USED WITH "L" SERIES 036-072 SERIES UNITS



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



ETL Certified per UL 1995 and CSA 22.2

SHIPPING AND PACKING LIST

Package 1 of 1 contains: **See Illustration 1 and 2.**

- 1 - Energy Recovery Ventilator Assembly
- 1 - Outdoor Fresh Air Hood with Filter
- 1 - Outdoor Exhaust Air Hood with Barometric Damper
- 1 - Balancing Damper Assembly
- 1 - Economizer Shroud
- 1 - Economizer Side Panel
- 1 - Economizer Channel
- 1 - LD Shield
- 1 - Door Panel
- 1 - Adaptor Panel
- 1 - Platform Support Rail
- 2 - Locking Tabs
- 1 - Hardware Bag:
 - 14' - Gasket $\frac{3}{4}$ " x 1 $\frac{1}{4}$ "
 - 7' - Gasket $\frac{1}{8}$ " x $\frac{1}{2}$ "
 - 1 - Field Harness
 - 1 - Jumper Harness
 - 1 - J3-3 Extension Wire
 - 4 - Wire Ties
 - 10- Self-Tapping Screws 10-16 x $\frac{1}{2}$ "
 - 20- Gold Screws 10-16 x $\frac{1}{2}$ "
 - 1 - Installation Instruction
 - 2 - Wiring Stickers

PRINCIPLE OF OPERATION

The ERS enthalpy wheel contains parallel layers of a polymeric material that are impregnated with silica gel (desiccant). The wheel is located in the entering (intake) air and exhaust air streams of the ventilation equipment. As the wheel rotates through each air stream, the wheel surface adsorbs 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.

! WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

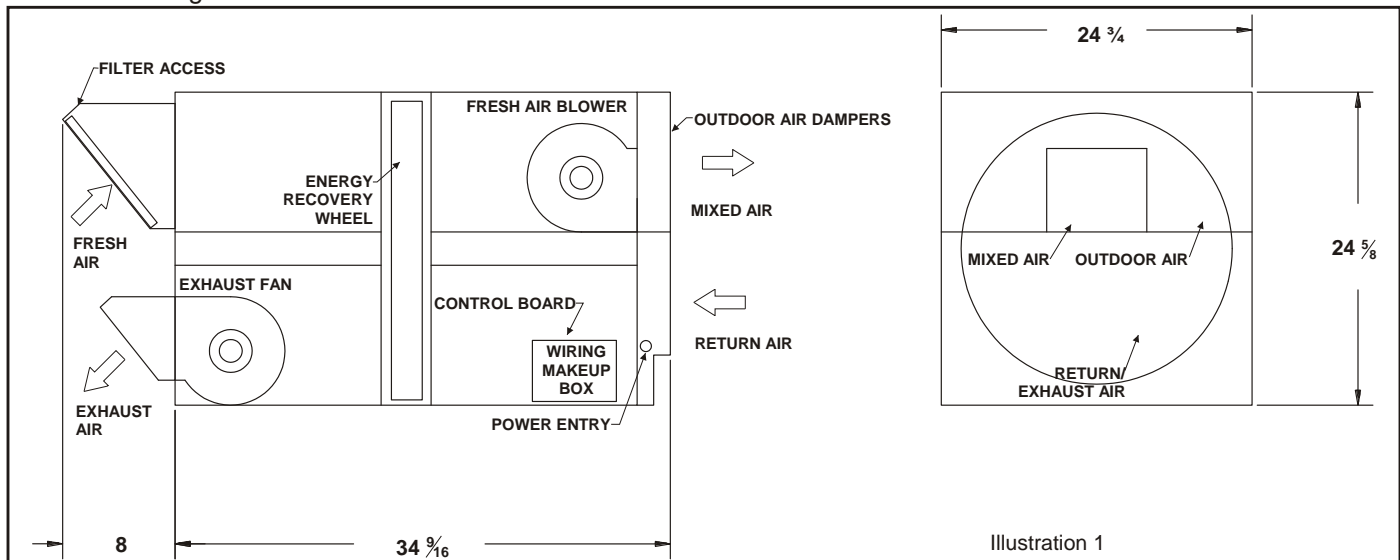


Illustration 1

CAUTION



Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

GENERAL

These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation.

REQUIREMENTS

When installed, the unit must be electrically wired and grounded in accordance with local codes or, in the absence of local codes, with the current National Electric Code, ANSI/NFPA No. 70.

SHIPPING DAMAGE

Check unit for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

RIGGING UNIT FOR LIFTING

1. Maximum weight of unit is — 150 Lbs (crated).
2. Remove crating and retrieve hardware bag that is inside of ERS.
3. All ERS door panels must be in place for rigging.
4. Use straps to lift unit.

ROOFTOP UNIT PREPARATION

1. Disconnect all power to rooftop unit.
2. Remove the rooftop unit horizontal return air access panels. Also remove any hoods and/or power exhaust equipment. Discard hoods, power exhaust equipment, and horizontal return air panels. **See Figure 1.**
3. Position economizer side panel in filter section. Secure economizer side panel to the economizer channel bracket and the flange on the unit base. **See Figure 3.**
4. Remove screws securing the unit top panel in place on the economizer end of the unit. Lift top panel to provide access to economizer section.
5. Install the economizer shroud, economizer divider panel, and economizer channel. Secure with screws. **See Figure 3.**
6. Open filter access door and slide in balancing damper in economizer rails. The damper blades should be at the bottom. The flange on the middle divider of the balancing damper should slide under the middle divider in the return air opening of the rooftop unit. **See Figure 3.**
7. Loosen wing nut on balancing damper. Slide arm to open blades 50% and then retighten wing nut.

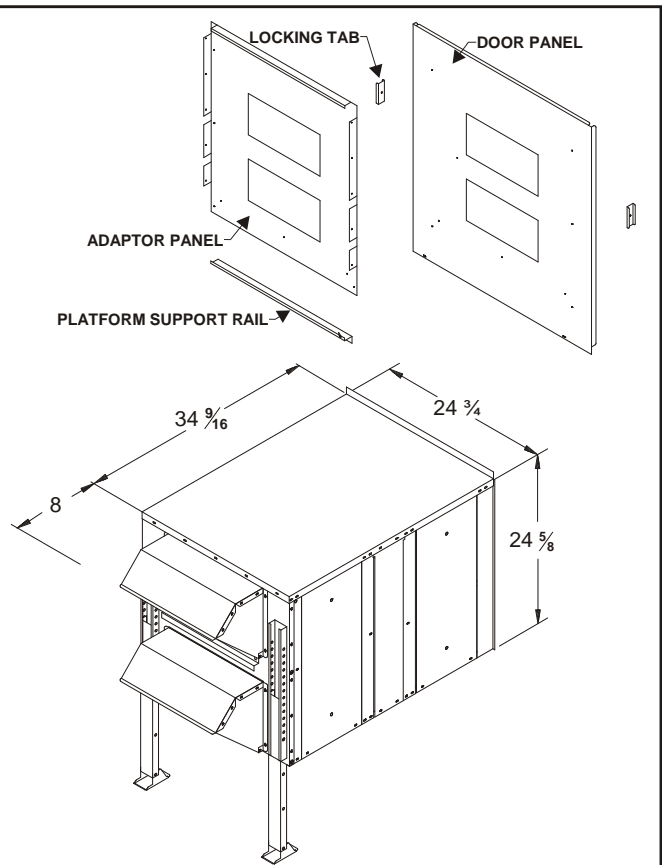


Illustration 2

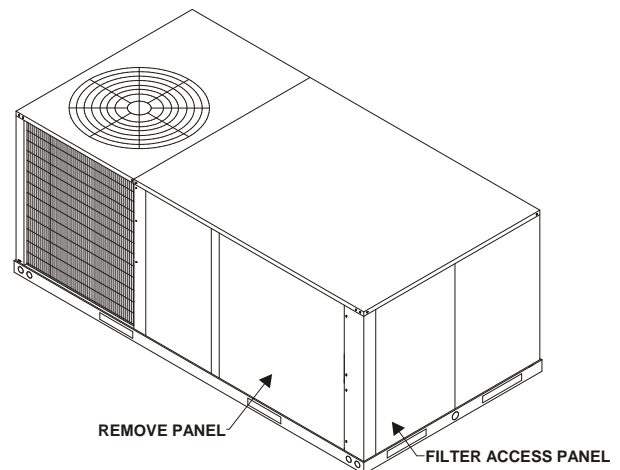


Figure 1

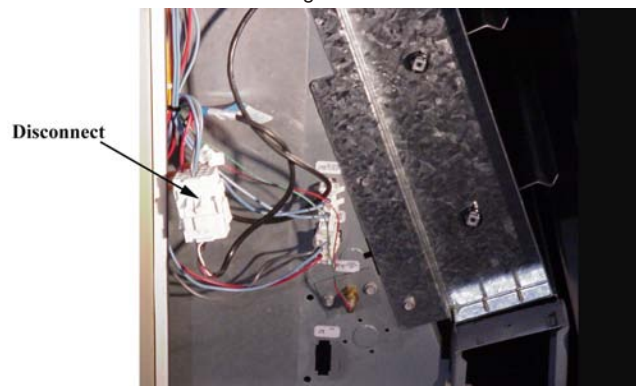


Figure 2

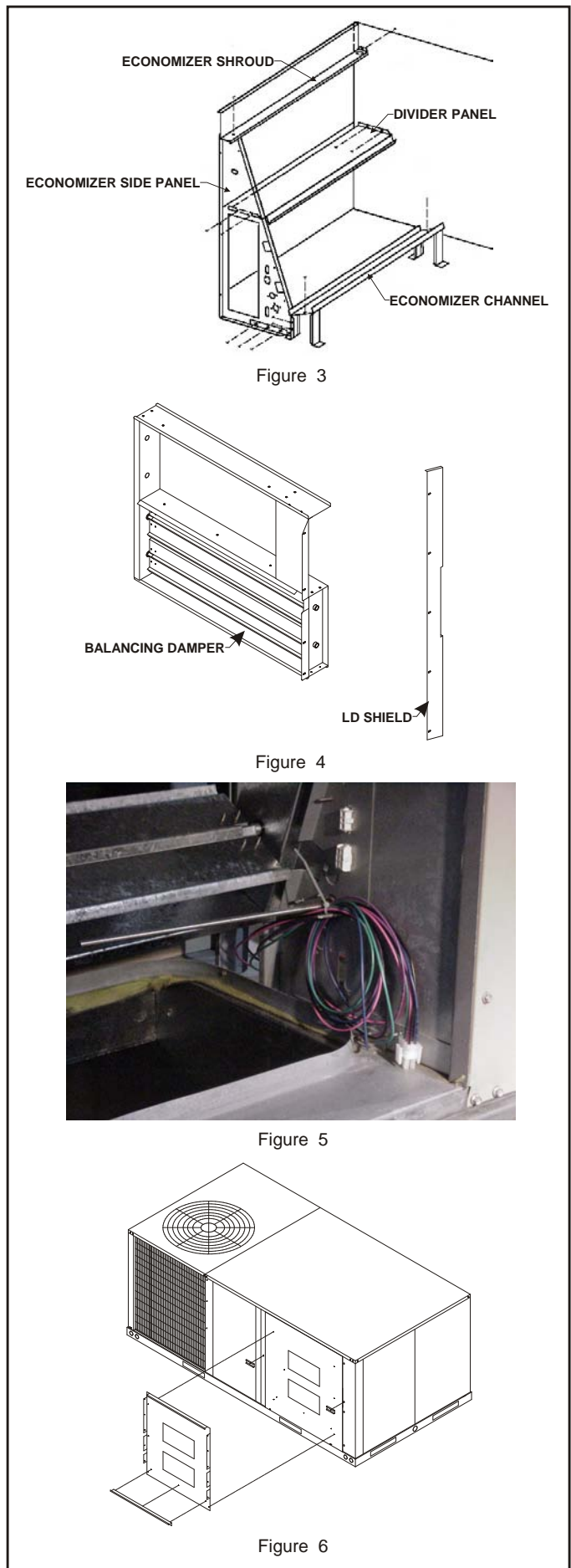
8. Secure balancing damper in place by screwing the LD shield to the economizer side panel. **See Figure 4.**
9. Plug field harness P27 into economizer plug J3. **See page 7 for field wiring.**
10. Using wire ties neatly route the wires to clear any moving parts.
11. Route the 3-pin connector P153 and wiring harness under the economizer and out the return air. Coil excess wire and route into return air of the rooftop unit. **See Figure 5.**
12. Secure the provided door panel to cover the horizontal return air access of the rooftop unit. **See Figure 6.**
13. Secure the provide adaptor panel to the door panel installed previously. Secure the platform support rail to the adaptor panel. **See Figure 6.**
14. Mount the provide locking tabs on each side of the door panel to prevent bowing. **See Figure 6.**
15. Remove all screws holding the top panel of rooftop unit around the horizontal exhaust air opening. Ensure that the top panel will move upward at least 2".

INSTALL ENERGY RECOVERY SYSTEM

1. Lift ERS at least three feet (3'). Remove four screws holding telescoping leg to guide and pull out leg. Reinsert the leg from the bottom with the flat foot under the unit and reinsert one of the screws to hold leg into place. The leg will need to be adjusted later when unit is in position.
2. Apply $\frac{3}{4}$ " x 1 $\frac{1}{4}$ " gasket to middle deck and bottom edge of ERS and apply $\frac{1}{8}$ " x $\frac{1}{2}$ " gasket to perimeter of ERS.
3. Position ERS in front of horizontal exhaust air opening. Line up the ERS to the rooftop unit. Ensure that there are not any screws on the rooftop unit that will interfere with the mounting flanges of the ERS and if so remove them.
4. Set ERS on platform support rail slide ERS up against adaptor panel. The side flanges of adaptor panel should fit inside the posts of ERS. Secure ERS to adaptor panel using the provided 10-16 x $\frac{1}{2}$ " screws. **See Figure 7.**

Note: *Equipment support kit or equivalent should be used to under feet of standoff legs to prevent roof penetration.*

5. Tuck the top flange of the ERS under the rooftop unit top panel and secure with the existing rooftop unit screws. **See Figure 7.**
6. Remove the screws placed in the standoff legs and adjust the legs on the ERS until it is level. Replace all four screws in each leg to secure the ERS in the leveled position. **See Figure 8.**
7. Check and seal, if necessary, along the edges where the ERS meets the rooftop unit to ensure there is no air leakage. Final assembly should resemble **Figure 8.**



8. Remove the right front (rooftop unit side) access panel and locate the field wiring harness that was previously routed into the return air of the rooftop unit. Plug the field wiring harness into the connector located at the bottom of the access door inside the ERS. **See Figure 9.**
 9. All electrical connections must conform to any local codes and the current National Electric Codes (NEC) and Canadian Electric Code (CEC). Refer closely to wiring diagram in unit and/or in these instructions for proper connections. Refer to the unit nameplate for the minimum circuit ampacity and maximum over current protection size. Electrical data is listed on unit rating plate and motor nameplates.
 10. Connect line voltage power to ERS unit from ERS field provided or rooftop unit disconnect switch (disconnect must be properly sized). Then connect line voltage from disconnect switch through ERS knockout on rear post to control box per the wiring diagram. **See Figure 10.**
 11. Ground unit with a suitable ground connection either through unit supply wiring or earth ground.
- Note: Unit voltage entries must be sealed weather tight after wiring is complete.**
12. Replace access panels onto the ERS unit and secure.

ROOFTOP UNIT WIRING
(See Field Wiring Diagram)

1. Open access panel to rooftop unit controls.
 2. Direct Drive Blower Motors
Disconnect red wire marked J3-3 from TB34 terminal 1. **See Figure 11.** Add extension wire (provided) to J3-3 wire. Connect J3-3 to combustion air blower relay K13 terminal 9. **See Figure 12.**
- Belt Drive Blower Motors*
Disconnect red wire marked J3-3 from TB34 terminal 1. **See Figure 11.** Add extension wire (provided) to J3-3 wire. Connect J3-3 to K3 blower relay coil terminal A. **See Figure 13.**
3. Affix D3 wiring diagram sticker, provided in kit, over current economizer sticker on compressor access door. Affix F3 wiring sticker, also provided, in alphanumeric order next to current diagrams.
 4. Close access panels on the rooftop unit and secure.
 5. Restore power to unit.
 6. Once ERS is working properly, caulk any open joints, holes, or seams to make the units completely air and water tight.
 7. Leave this instruction manual with owner or in an envelope to be kept near unit.

OPTIONAL KITS (Factory Installed)

Motorized Intake Air Damper
Damper mounts behind the outdoor air intake hood. It opens when the ERS is energized and closes when de-energized. Powered by B30 damper motor.

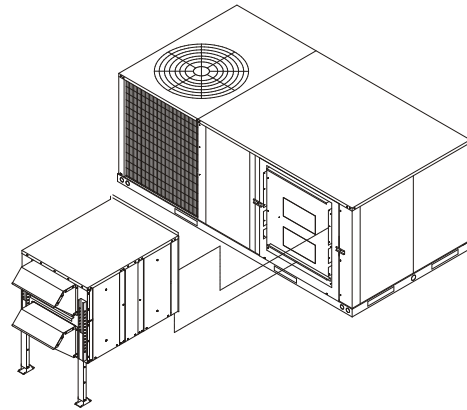


Figure 7

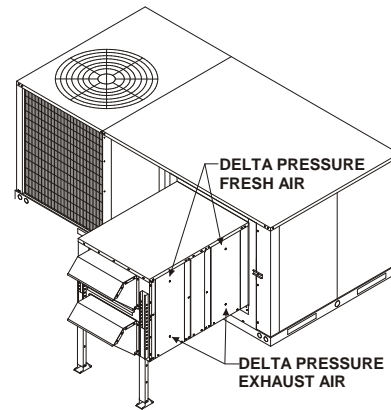


Figure 8

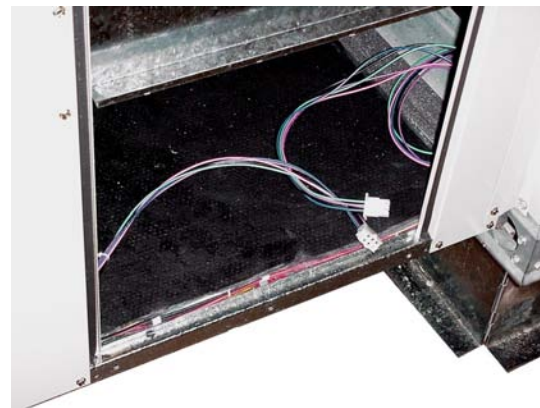


Figure 9



Figure 10

Pressure Sensor

Measurement device on the ERS to determine airflow across the Enthalpy Wheel.

Low Ambient Control Kit (S26)

Prevents frost formation on energy wheel heat transfer surfaces by terminating the intake blower operation when discharge air temperature falls below a field selectable temperature setting. Intake blower operation resumes operation after temperature rises above the adjustable temperature differential.

The frost threshold is the outdoor temperature at which frost will begin to form on the ERS wheel. For energy recovery ventilators, the frost threshold is typically below 10°F. Frost threshold is dependent on indoor temperature and humidity. The table shows how the frost threshold temperatures vary depending on indoor conditions.

FROST THRESHOLD TEMPERATURE	
INDOOR RH AT 70°F	FROST THRESHOLD TEMPERATURE
20%	0°F
30%	5°F
40%	10°F

Because Energy Recovery Systems have a low frost threshold, frost control options are not necessary in many climates. Where outdoor temperatures may drop below the frost threshold during the ERS operational hours, exhaust only frost control option is available.

Stop-Start-Jog

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

BLOWER SPEED ADJUSTMENT

Blower speed selection is accomplished by changing the selector switch (refer to wiring diagram) on both fresh air and exhaust air blowers. All blowers are factory set at "high" for maximum airflow. To determine air flow setting, external static pressure readings will need to be read across the ERS. **Reference Table 1.** For location to take pressure readings. **See Figure 13.**

OPERATION

Recovery Wheel Mode

On a thermostat call for blower operation in heating, cooling or continuous blower, the ERS media will rotate between fresh air and exhaust air streams. Both the fresh air blower and exhaust air blower will be operating.

SYSTEM CHECK

Check that blowers and energy recovery wheel are operating properly.

MAINTENANCE

Motor Maintenance

All motors use prelubricated sealed bearings; no further lubrication is necessary.

Mechanical Inspection

Make visual inspection of dampers, linkage assemblies and ERS rotating bearings during routine maintenance. Filters should be checked periodically and cleaned when necessary. Filter is located in fresh air hoods. **DO NOT** replace permanent filters with throwaway type filters.

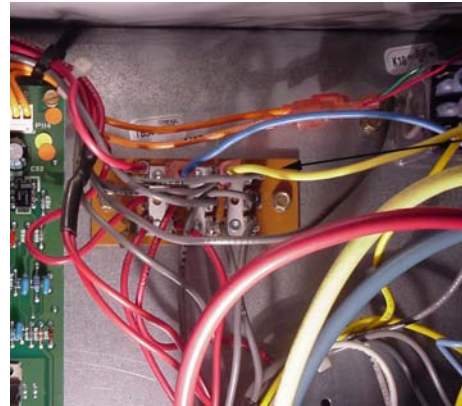


Figure 11

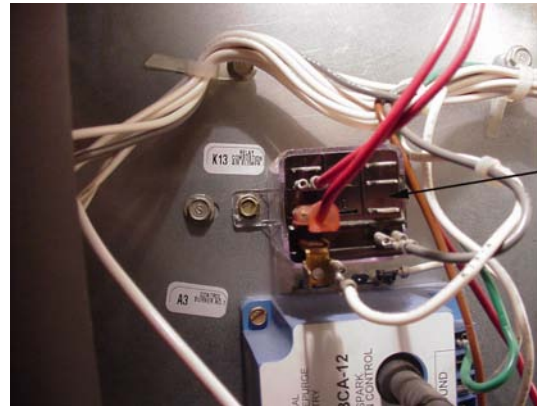


Figure 12

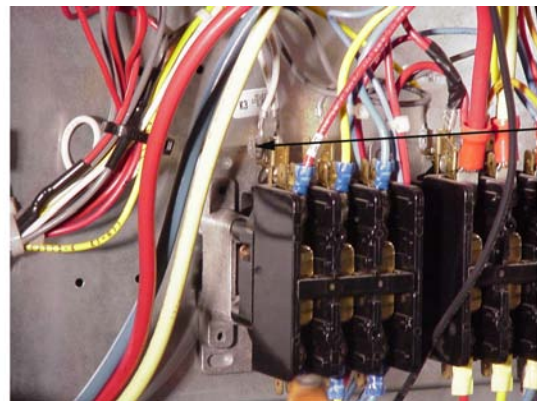


Figure 13

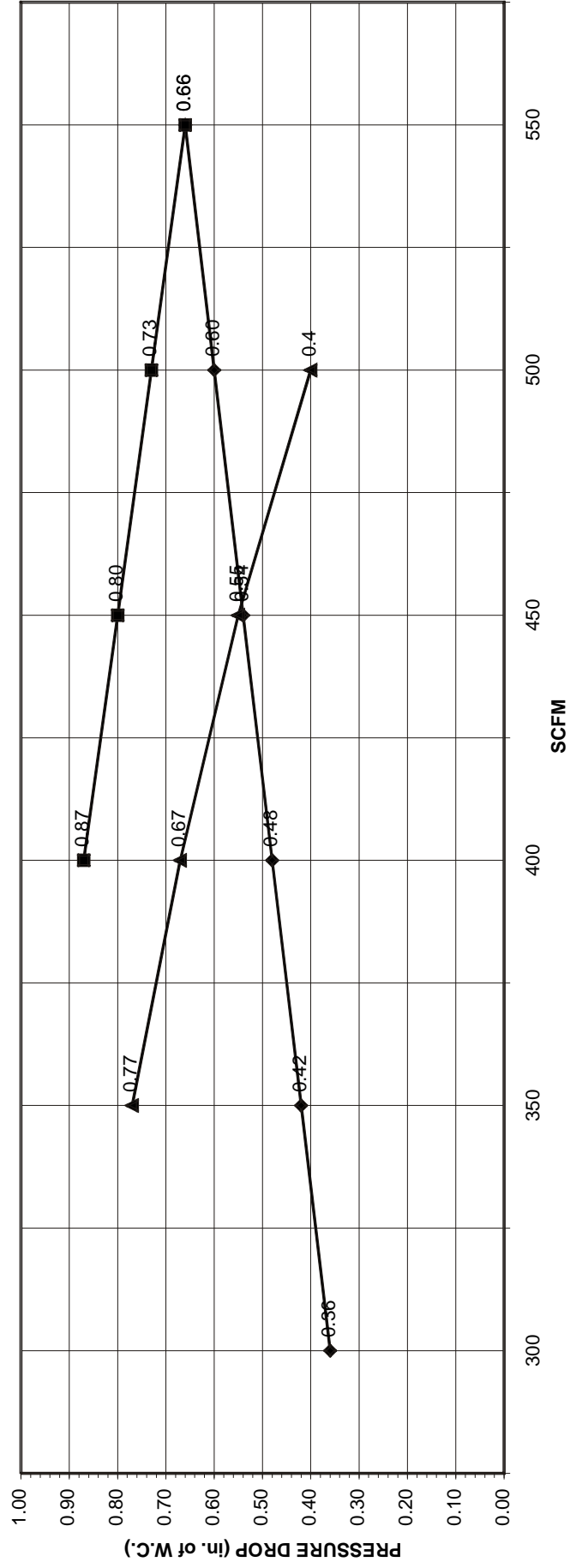
Energy Wheel Maintenance

Annual inspection of the self cleaning wheel is recommended. With power disconnected, remove ERS access panels (rear) and unplug [J150 and P150] (**Refer to wiring diagrams in this instruction manual**). Remove media and wash with water and/or mild detergent. Replace media by reversing the above procedure.

ENERGY RECOVERY SYSTEM

SCFM vs. PRESSURE DROP

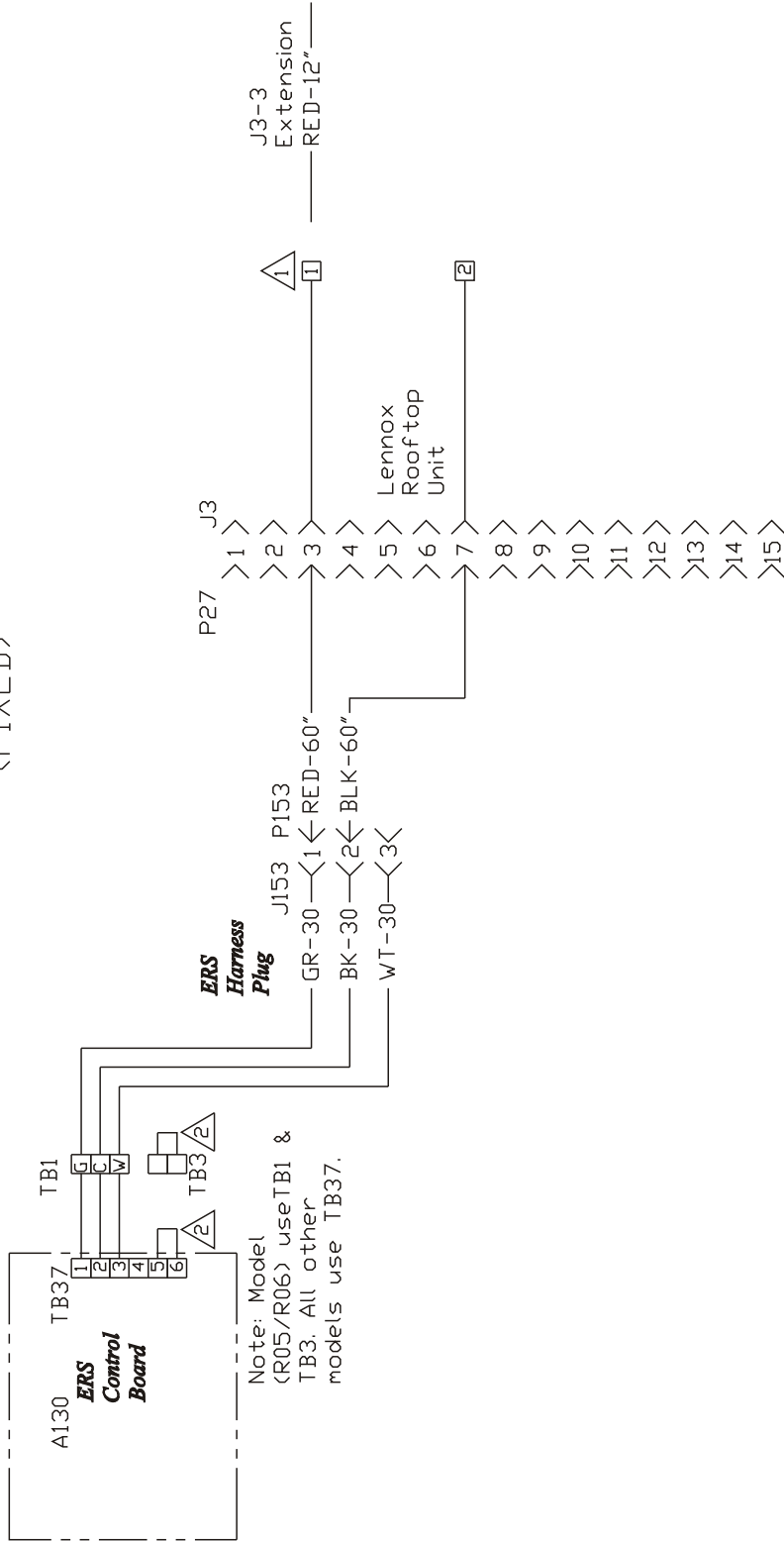
ERS Series
 Blow Hi
 Blow Lo



Equation of line: $SCFM = (PD) / 0.0012$
TABLE #1

Field Wiring Harness

"L" SERIES
<FIXED>

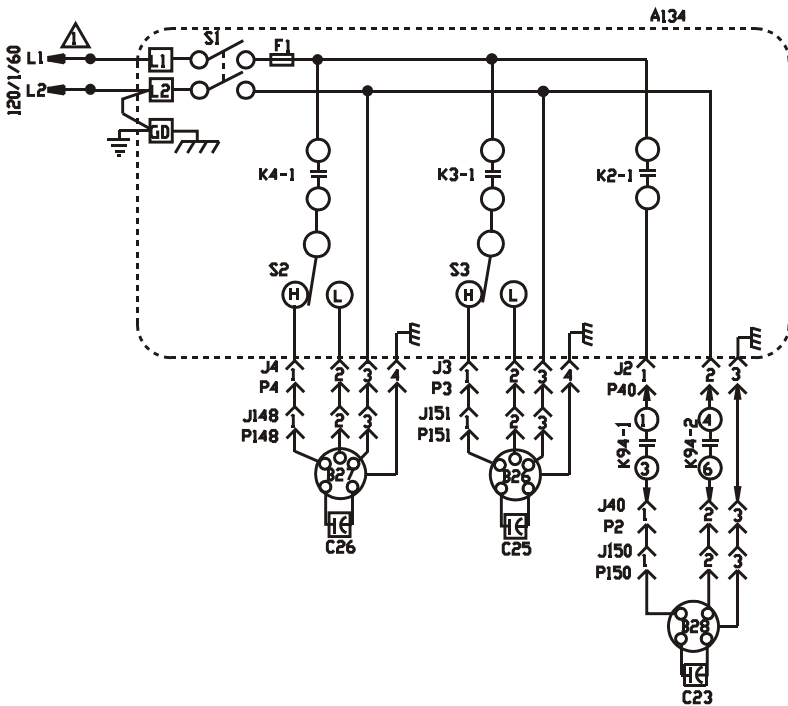
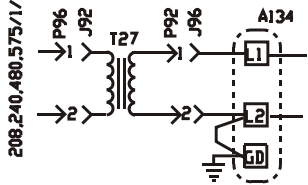


1 Reposition wire J3-3 in rooftop unit at TB34 to K13 terminal 9 (Direct Drive) or K3-A (Belt Drive) by adding extension.

2 Remove jumper to install optional low ambient switch.

KEY	DESCRIPTION
A134	CONTROL - FIXED WHEEL
B26	MOTOR-EXHAUST AIR BLOWER
B27	MOTOR-FRESH AIR BLOWER
B28	MOTOR-DESICCANT WHEEL
C23	CAPACITOR-WHEEL MOTOR
C25	CAPACITOR-MOTOR EXHAUST AIR
C26	CAPACITOR-MOTOR FRESH AIR
K94-1,2	RELAY-ON-OFF
J40	JACK-WHEEL CYCLE
J92	JACK-TRANSFORMER
J96	JACK-POWER INTERFACE
J148	JACK-FRESH AIR BLOWER
J150	JACK-WHEEL MOTOR
J151	JACK-EXHAUST BLOWER MOTOR
P92	PLUG-TRANSFORMER
P96	PLUG-POWER INTERFACE
P148	PLUG-FRESH AIR BLOWER
P150	PLUG-WHEEL MOTOR
P151	PLUG-EXHAUST BLOWER MOTOR
T27	TRANSFORMER-DESICCANT WHEEL

208,240,480,575/1/60



NOTE-FOR USE WITH COPPER CONDUCTORS ONLY
REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT
AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT
MUST BE REPLACED WITH WIRE OF LIKE SIZE,RATING
AND INSULATION THICKNESS

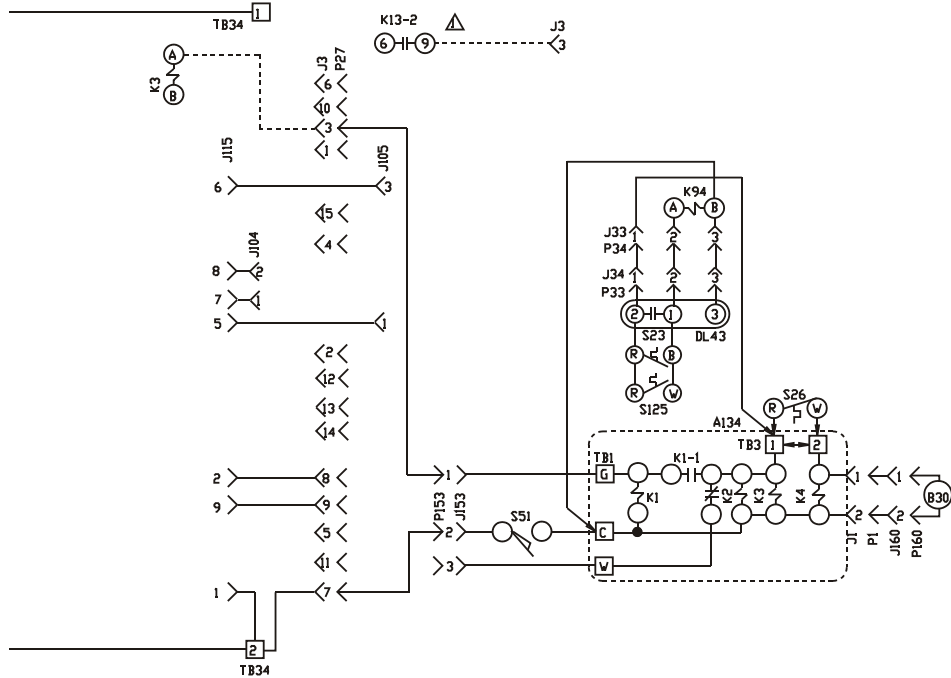
DISCONNECT ALL POWER BEFORE SERVICING
THERMOSTAT HEAT ANTICIPATION SETTING 0.1 AMP

**WARNING-ELECTRIC SHOCK HAZARD,CAN CAUSE INJURY
OR DEATH. UNIT MUST BE GROUNDED IN
ACCORDANCE WITH NATIONAL AND LOCAL CODES**

← DENOTES OPTIONAL COMPONENTS
— LINE VOLTAGE FIELD INSTALLED NEC/CEC CLASS 1
NOTE-ALL REMAINING WIRES FACTORY INSTALLED

WIRING DIAGRAM	10/02
COMBINATION PACKAGED/ROOFTOP	
FIXED ENERGY RECOVERY WHEEL 16 SERIES	
16AERS	
HEAT/COOL SECTION F3	
Supersedes Form No.	New Form No.
	534,265W

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KEY	DESCRIPTION
A134	CONTROL-ERS
B30	MOTOR-DAMPER
DL43	DELAY-CYCLE TIMER
J3	JACK-UNIT ECONOMIZER
J33	PLUG-CYCLE CONTROL
J34	JACK-CYCLE CONTROL HARNESS
J104	JACK-SENSOR OUTDOOR ENTHALPY
J105	JACK-SENSOR RETURN AIR ENTHALPY
J115	JACK-ECONOMIZER OUTPUT
J153	JACK-ENTHALPY/DAMPER MOTOR
J160	JACK-DAMPER MOTOR
K3	CONTACTOR-BLOWER
K13-2	RELAY-COMB AIR INDUCER
K94	RELAY-ON-OFF
P27	PLUG-ECONOMIZER ADAPTER
P33	PLUG-CYCLE CONTROL
P34	PLUG-CYCLE CONTROL HARNESS
P153	PLUG-ENTHALPY/DAMPER MOTOR
P160	PLUG-DAMPER MOTOR
S23	THERMOSTAT-LOW AMBIENT CUT IN
S26	THERMOSTAT-AMBIENT
S51	SWITCH-DOOR INTERLOCK 1
S125	SWITCH-AMBIENT OVERRIDE
TB34	TERMINAL STRIP-TRANSFORMER T1

△ FOR L SERIES UNITS, 036,042,048,060,072 WITH B3 DIRECT DRIVE BLOWER MOTOR WITH HEATING AND COOLING SPEEDS, CONNECT WIRE FROM J3-3 TO K13-9.

← DENOTES OPTIONAL COMPONENTS

WIRING DIAGRAM		9/03
ACCESSORIES		
DAD WITH FIXED WHEEL ENERGY RECOVERY SYSTEM FOR "L" SERIES UNITS LAERS		
SECTION-D3		
Supersedes Form No.	New Form No.	
	534,266W	
© 2002	LITHO U.S.A.	

Lennox Model No.	Req'd Curb Height	CFM Range	Voltage	Phase
50-R06-30xH-21	14"	600-1000	208-230	1
50-R06-30xH-23	14"	600-1000	208-230	3
50-R06-30xH-33	14"	600-1000	460	3
50-R06-30xH-43	14"	600-1000	575	3

START UP INFORMATION SHEET

VOLTAGE - UERV UNIT

Incoming Voltage L1-L2 _____ L1-L3 _____ L2-L3 _____
Running Voltage L1-L2 _____ L 1-L3 _____ L2-L3 _____
Secondary Voltage _____ C (black) to G (green) Volts* _____
C (black) to W (white) Volts* _____

* With thermostat calling.

AMPERAGE - UERV MOTORS

Intake Motor: Nominal HP _____ Rated Amps _____ Running Amps _____
Exhaust Motor: Nominal HP _____ Rated Amps _____ Running Amps _____
Wheel Motor: Nominal HP _____ Rated Amps _____ Running Amps _____

AIRFLOW

Intake Design CFM _____ Pressure Drop _____ Calculated CFM _____
Exhaust Design CFM _____ Pressure Drop _____ Calculated CFM _____
Amb. db Temp _____ Return Air db Temp* _____ Tempered Air db Temp* _____
Amb. wb Temp _____ Return Air wb Temp* _____ Tempered Air wbTemp* _____

* Measure after 15 minutes of run time

INSTALLATION CHECK LIST

Model # _____ Serial # _____
Owner _____ Owner Phone # _____
Owner Address _____
Installing Contractor _____ Start Up Mechanic _____

- Inspect the unit for transit damage and report any damage on the carrier's freight bill.
- Check model number to insure it matches the job requirements.
- Install field accessories and unit adapter panels as required. Follow accessory and unit installation manuals.
- Verify field wiring, including the wiring to any accessories.
- Check all multi-tap transformers, to insure they are set to the proper incoming voltage.
- Verify correct belt tension, as well as the belt/pulley alignment. Tighten if needed.
- Prior to energizing the unit, inspect all the electrical connections.
- Power the unit. Bump the motor contactor to check rotation. Three phase motors are synchronized at the factory. If blower motor fans are running backwards, de-energize power to the unit, then swap two of the three incoming electrical lines to obtain proper phasing. Re-check.
- Perform all start up procedures outlined in the installation manual shipped with the unit.
- Fill in the Start Up Information as outlined on the opposite side of this sheet.
- Provide owner with information packet. Explain the thermostat and unit operation.