

INSTALLATION, OPERATION & MAINTENANCE MANUAL ENERGY RECOVERY VENTILATOR

HE1XIN



MODEL: HE1XINH





ABOUT RENEWAIRE

For over 30 years, RenewAire has been a pioneer in enhancing indoor air quality (IAQ) in commercial and residential buildings of all sizes. This is achieved while maximizing sustainability through fifth-generation, enthalpic-core, static-plate Energy Recovery Ventilators (ERVs) that improve energy efficiency, lower capital costs via load reduction and decrease operational expenses by minimizing equipment needs, resulting in significant energy savings. Our ERVs are competitively priced, simple to install, easy to use and maintain and have a quick payback. They also enjoy the industry's lowest warranty claims due to long-term reliability derived from innovative design practices, expert workmanship and Quick Response Manufacturing (QRM).

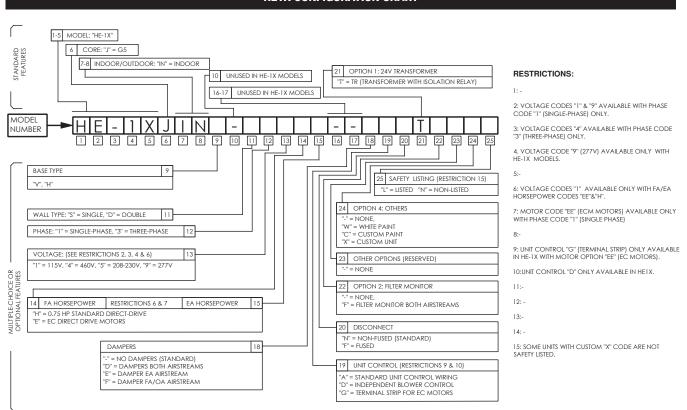
TABLE OF CONTENTS

HE1XIN info	2-
Installation	6-1
Start-up	14-1
Maintenance	16-18

As the first producer of static-plate core technology in North America, RenewAire presently has over 180,000 units in operation and is now one of the largest ERV companies in the world. We're committed to sustainable manufacturing and lessening our environmental footprint, and to that end our Madison, WI plant is 100% powered by wind turbines. The facility is also one of the few buildings worldwide to be LEED- and Green Globes-certified, as well as having achieved ENERGY STAR Building status. In 2010, RenewAire joined the Soler & Palau (S&P) Ventilation Group in order to provide direct access to the latest in HVAC technologies. For more information, visit: www.renewaire.com.

HE1XIN INFO

HE1X CONFIGURATION CHART





HE1XIN INFO

Airflow (CFM) 200 400 600 800 1000 8 90% 90% Sensible Winter Total Summer Total

VENTILATION TYPE Static Plate, Heat and Humidity Transfer

SPECIFICATIONS

NOTE: Specifications may be subject to change without notice.

Unless otherwise specified, dimensions are rounded to the nearest eighth of an inch.

For the latest product information available visit our website at renewaire.com or call us at 800-627-4499

SUPPLEMENTAL MANUALS AVAILABLE FOR THE HE1.5XIN

Commercial Unit Start-Up

Factory Installed Optional Dampers

ECM Option

Filter Alarms Controls

FEATURES

Orientations:

Horizontal - HE1XINH Vertical - HE1XINV

Typical Airflow Range:

250-925 CFM

AHRI 1060 Certified Core:

One L125-00

Airflow Rating Points (for AHRI):

750 CFM and 563 CFM

Standard Features:

Non-fused Disconnect

24 VAC Transformer/Relay Package

Filters:

Two total, MERV 8, 2" pleated, 20" x 20" nominal size

Weight:

211lbs (unit), 300 lbs. (shipping weight, on pallet)

Shipping Dimensions:

62" L x 48" W x 55" H

Options:

ECM motor - Two, 115V or 208-230V - 0.5 hp

(Single Phase)

Fused Disconnect

Double wall Construction

Motorized Isolation Dampers, OA, EA or both airstreams

Factory mounted Filter Alarms (2) Independent Blower Control

MERV 13 Filters

Accessories:

Wall Caps

Back Draft Dampers

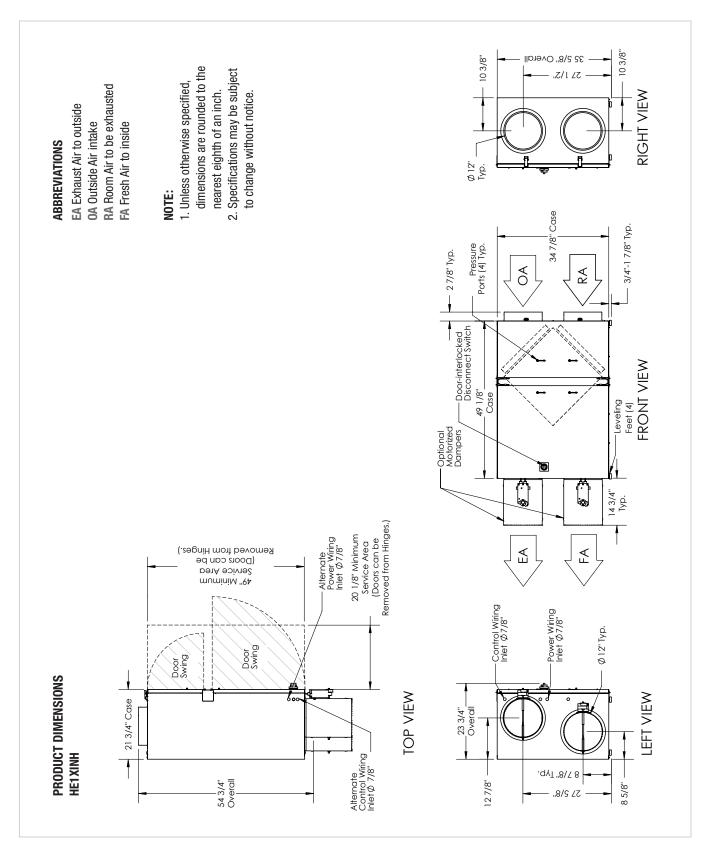
MOTORS : Two Direct drive blower/motor packages									
V	HZ	PHASE	FLA (per motor)	Min. Cir. Amps	Max. Overcurrent Protective Device				
115	60	Single	9.0	20.3	25				
208-230	60	Single	4.5	10.1	15				
227	60	Single	3.9	8.8	15				
208-230	60	Three	1.7-2.3	5.2	15				
460	60	Three	1.15	2.6	15				

AIRFLOW PERFORMANCE									
Motor HP	External Static pressure (inches Water column)								
Phase	0.0	0.25	0.5	0.75	0.9	1.25	1.5		
0.75 Single Phase	970 CFM 1,490 Watts	925 CFM 1,375 Watts	860 CFM 1,270 Watts	795 CFM 1,160 Watts	750 CFM 1,090 Watts	635 CFM 950 Watts	480 CFM 825 Watts		
0.75 Three Phase	970 CFM 1,246 Watts	925 CFM 1,158 Watts	860 CFM 1,039Watts	795 CFM 928 Watts	750 CFM 856 Watts	635 CFM 691 Watts	480 CFM 509 Watts		

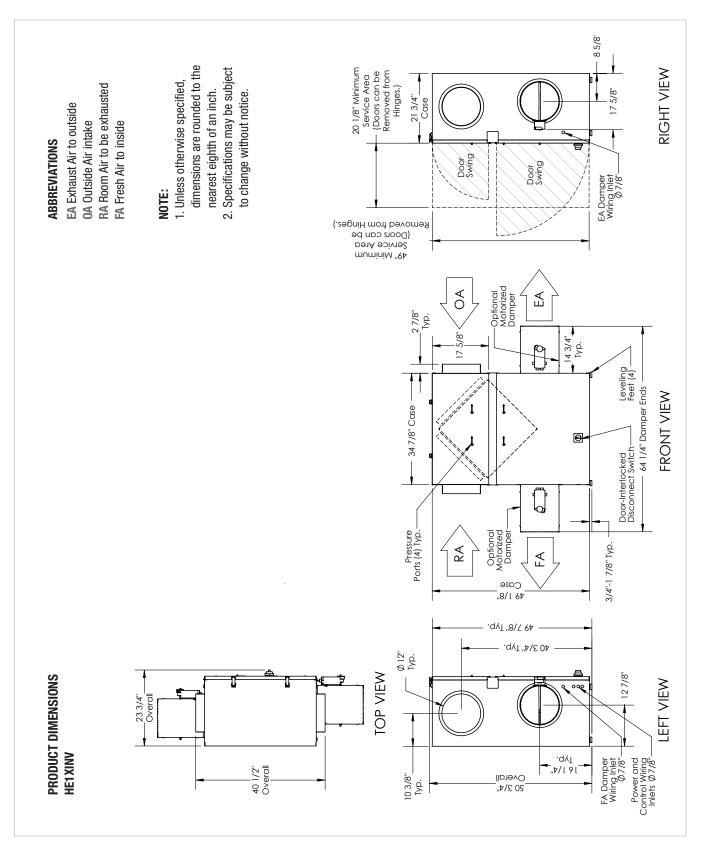
^{*} Performance Ratings assume standard-equipment 2" MERV-8 filters in clean condition.



HE1XIN INFO



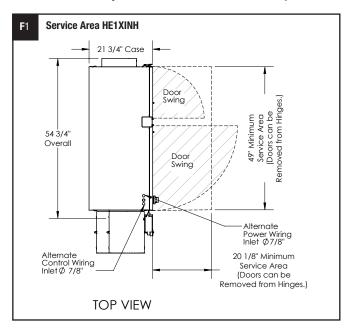
HE1XIN INFO

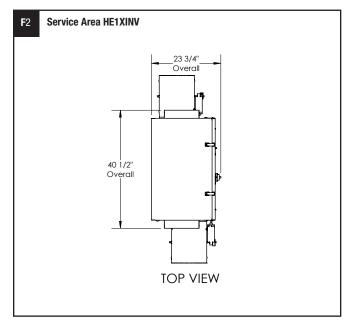


PLANNING YOUR INSTALLATION

PLACEMENT OF THE HE1XIN

The HE1X is designed for installation indoors. Select a location that is central to the inside duct runs, and close to both the exhaust duct (to the outside) and the fresh air duct (from the outside). The unit can be installed in any orientation but the contractor is responsible for safe installation of the unit.







DUCTS TO THE OUTSIDE

The exhaust outlet and fresh air inlet on the outside of the building should be at least ten feet apart to avoid cross-contamination. The exhaust outlet should not dump air into an enclosed space or any other structure. The inlets and outlets should be screened against insects and vermin and shielded from the weather to prevent the entry of rain or snow.

⚠ WARNING

The fresh air inlet should be at least 10' away from chimneys, furnace and water heater exhausts, and other sources of carbon monoxide, humidity or other contamination. Do not locate the fresh air inlet where vehicles may be serviced or left idling. Never locate the fresh air inlet inside a structure.

PLANNING YOUR INSTALLATION

NOTE: To prevent the entry of rain through the outside air inlet duct, observe the following:

- 1. Velocity at face of inlet hood should not exceed 500 feet per minute (fpm).
- 2. Inlet duct must be at least 12" inside diameter.
- 3. Centerline length along duct from weather hood to unit inlet must be at least 48".
- Inlet duct must pitch downward to the outside; centerline of inlet hood must be at least 18" below the centerline of the unit inlet.
- 5. Outlet duct must pitch downward to the outside with a slope of at least 1/4" to the foot.

Ducts connecting the HE1X to the outside must be insulated, with sealed vapor barrier on both inside and outside of the insulation. Insulate both the Outside Air (OA) and Exhaust Air (EA) ducts.

INSIDE DUCTWORK SYSTEM

Ensure Good Ductwork Design

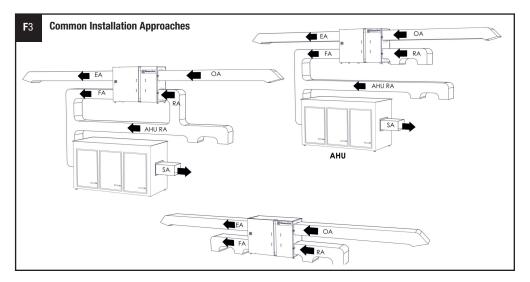
Ductwork should be designed to allow the unit to provide the required airflow and reduce pressure drop for efficient, quiet operation. If the inside ducts run through unconditioned spaces they must be insulated with a sealed vapor barrier on both inside and outside of insulation.

Use Non-motorized Dampers to Set and Balance Air

In most applications, the airflow rate for both the Fresh Air and the Exhaust Air should be roughly equal (or "balanced") for best performance of the HE1X Unit. See unit specification sheet for CFM/ESP curves.

APPLICATIONS

See figure F3 for examples of some common installation approaches.





PLANNING YOUR INSTALLATION

⚠ WARNING

RISK OF FIRE, ELECTRIC SHOCK, OR INJURY. OBSERVE ALL CODES AND THE FOLLOWING:

- Before servicing or cleaning the unit, switch power
 off at disconnect switch or service panel and lockout/tag-out to prevent power from being switched
 on accidentally. More than one disconnect switch
 may be required to de-energize the equipment
 for servicing.
- This installation manual shows the suggested installation method. Additional measures may be required by local codes and standards.
- Installation work and electrical wiring must be done by qualified professional(s) in accordance with all applicable codes, standards and licensing requirements.
- Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements.
- 5. This unit must be grounded.
- Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment that might be

- installed in the area affected by this equipment. If this unit is exhausting air from a space in which chimney-vented fuel burning equipment is located, take steps to assure that combustion air supply is not affected. Follow the heating equipment manufacturer's requirements and the combustion air supply requirements of applicable codes and standards.
- Use the unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
- This unit is intended for general ventilating only.
 Do not use to exhaust hazardous or explosive materials and vapors. Do not connect this unit to range hoods, fume hoods or collection systems for toxics.
- When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
- If installed indoors this unit must be properly ducted to the outdoors.

SOUND ATTENUATION

Take these simple steps to attenuate noise from the unit.

OUTSIDE THE BUILDING

Exhaust velocity noise is the primary cause of unit-related noise outside the building. Size the exhaust duct and grille for less than 1000 FPM air velocity. When practical, orient the exhaust air hood to point away from houses or public areas.

DUCTS

Make sure the ductwork at the unit outlets is stiff enough to resist the flexure and resulting booming associated with system start-up and shut-off, as well as the turbulent flow conditions at the blower outlets.

In general, provide smooth transitions from the ERV's outlets to the duct. The ducts connecting to the outlets should be straight for a sufficient distance, with gradual transitions to the final duct size.

These guidelines are consistent with SMACNA recommended duct layout practices for efficient and quiet air movement. Follow SMACNA guidelines.

RADIATED NOISE

The HE1XIN is insulated with high-density fiberglass. This provides significant attenuation of radiated sound.

The outlet ducts can be significant sources of radiated sound as well. The FA and EA ducts (outlet ducts) should be insulated for sound control. This insulation should start at the unit. At a minimum the first ten feet of duct should be insulated. All parts of the FA and EA ducts located in the mechanical space should be insulated for sound control, both to minimize sound radiation out of these ducts and also to control sound radiation into the ducts.

AERODYNAMIC (VELOCITY) NOISE

When sound attenuation is a design concern, the primary consideration is velocity noise at the unit's Fresh Air blower outlet. The average velocity at the blower outlets is 1235 FPM when the unit is operating at 970 CFM.

CAUTION

To avoid motor bearing damage and noisy and/or unbalanced blowers, keep drywall spray, construction dust, etc., out of unit.



INSTALLATION INSTRUCTIONS

ACCESSORIES

These ERVs may be ordered with factory-installed features including Isolation Dampers and Electronically Commutated Motors. Consult the supplemental Installation and Operation Manual(s) for these features if supplied.

NOTE: Standard HE1XIN with single phase original equipment motors are suitable for use with solid state speed control.

Le HE1XIN avec moteurs d'équipement d'origine monophasés sont adaptés pour une utilisation avec regulateur de vitesse electronique.

⚠ WARNING

Three phase motors are NOT suitable for use with solid state speed control. If speed control is desired use the VFD option.

Single phase ECM motors are NOT suitable for use with solid state speed control. They already have speed control built into the motor electronics.

Moteurs de trois phase ne convient pas pour utilisation avec regulateur de vitesse electronique. Si la régulation de vitesse est souhaité, utiliser l'option VDF.

Moteurs d'une phase de l'ECM ne conviennent pas pour une utilisation avec regulateur de vitesse electronique. Ils ont déjà le contrôle de vitesse intégré dans le moteur électronique.

CAUTION

The HE1X weighs 210 lbs. It is the installer's responsibility to make sure that the screws or bolts used for securing the units are properly selected for the loads and substrates involved.

⚠ WARNING

Secure the HE1X with straps or clamps so that it cannot fall or tip in the event of accident, structural failure or earthquake.

MOUNTING THE UNIT

The HE1X is manufactured with four screwadjustable legs for installation at floor level in an upright position. Adequate clearance for the filter access door latches must be provided.

The HE1X may also be hung on the wall or suspended from a ceiling. Screw or bolt mounting straps or brackets directly to the sheet metal case as necessary. Remove the access doors before installing screws — make sure your fasteners don't damage internal parts. Do not screw into the access doors

NOTE: That leveling legs supplied with HE1X can be removed and replaced with 3/8-16 bolts to secure unit to mounting brackets, if desired.

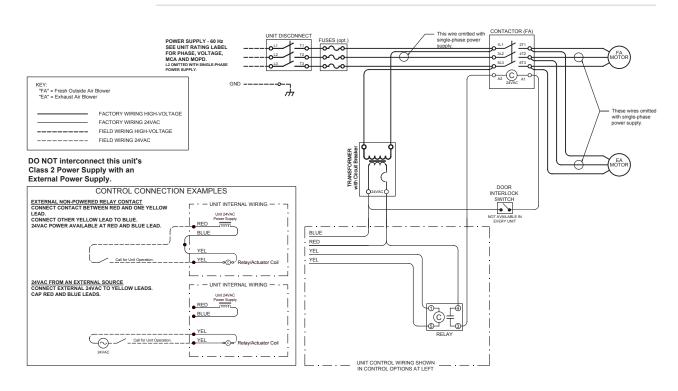
ELECTRICAL SPECIFICATIONS

Use conduit, strain reliefs, etc. as required by code to secure the field wiring. Electrical knockouts are provided for alternate line voltage and voltage control locations for field wiring to the internal electrical box. If the alternate sites are desired for field wiring then carefully remove the knockout plugs and foam insulating plugs from the alternate sites and install them in the open knockout locations.

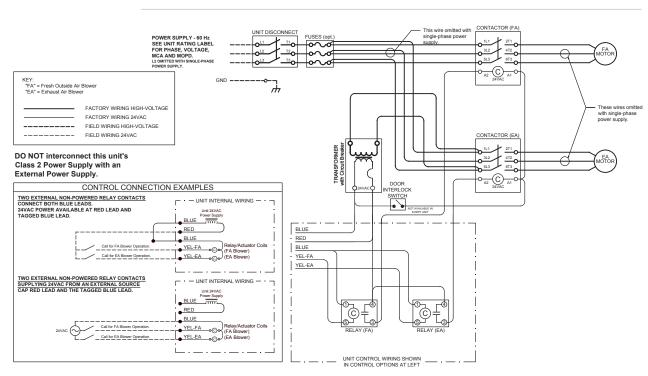
NOTE: If your unit is equipped with EC Motors, please refer to "EC Motor Manual Supplement for RenewAire Light Commercial Units" for more detail.



WIRING SCHEMATICS HE1XIN P1 AND P3 SINGLE OR THREE PHASE UNIT - STANDARD



HE1XIN P1 AND P3 IBC SINGLE OR THREE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL





LOW VOLTAGE CONTROL SYSTEM

This ERV is provided with a Class II 24VAC power supply system that operates the unit's contactor(s) for HE1X. The ERV's 24VAC Power Supply can also be used to power the externally-installed controls system: up to 8VA of power is available.

The unit's power supply system includes isolation relay(s) so you can use external controls whose contact ratings are as low as 50mA (1.2VA). Also, it is possible to operate the isolation relays with 24VAC power from an external source (with proper wiring connections).

A built-in circuit-breaker prevents damage to the transformer and other low-voltage components in the event of a short-circuit or overload. In extreme cases, the transformer itself is designed to fail safely.

SPECIFICATIONS

- Nominal Output Voltage under load: 24VAC
- Typical Output Voltage at no load: 29-31V
- · Minimum contact rating for connected control device: (50mA (1.2VA)
- · Circuit Breaker Trip Point: 3A

INSTALLATION INSTRUCTION

CAUTION

- 1. Connect only to components intended for use with 24VAC power.
- 2. Do not undersize the low-voltage wires connected to this device. Observe the wire length and gauge limits indicated in this manual.
- 3. Do not overload this unit's 24VAC power supply system. Confirm that the power requirements of devices you connect to this power supply system do not exceed 8VA in total.
- 4. If an external source of 24VAC power is used to control the unit, consult the wiring schematics and connect the external power only to the specified terminals in order to avoid damaging the unit or external controls. Connect only CLASS II power to the control terminals of this unit.
- 5. Unit is not equipped to receive analog signals (such as 1-10vdc or 4-20mA).
- 6. Unit is not equipped to communicate directly with Building Management Systems (such as BACNET, LONWORKS, etc.). However, the unit can be controlled by powered or non-powered contacts operated by any kind of control system.

HOW TO RESET THE 24VAC CIRCUIT BREAKER

If the transformer is subjected to an excessive load or a short circuit, the circuit breaker will trip to prevent the failure of the transformer. When it trips the circuit breaker's button pops up. Shut off the primary-side power to the unit, and remove the excessive load or the short. The circuit breaker can be reset about fifteen seconds after it trips by pressing in the button.

LIMITS OF POWER OUTPUT

If limits on wire gauge and length are observed, you may connect control devices that draw up to 8VA to the blue and red wires. More than one device can be connected as long as total steady-state load does not exceed 8VA.

OBSERVE THESE LIMITS TO WIRE LENGTH AND GAUGE in order to ensure reliable operation of the control system.									
Wire Gauge	#22	#20	#18	#16	#14	#12			
Circuit Length	100'	150'	250'	400'	700'	1000'			
"Circuit Length" is distance from ERV to Control Device.									

INSTALLATION NOTES

If primary-side voltage is 230VAC, move black primary-side lead from transformer's "208V" terminal to the transformer's terminal marked "240V" ("230V" in some units). Do not move the black primaryside lead that is connected to the transformer's "COM" terminal.



CONTROL WIRING SCHEMATICS

NOTE: The simplified schematics below show only the relevant portions of the low-voltage control circuit in the ERV unit and representational external control approaches. See the complete unit schematics elsewhere in this manual.

CAUTION

Be careful if the external control system provides 24VAC power at its control output: make sure blue and red leads are separately capped and not connected to any other wires.

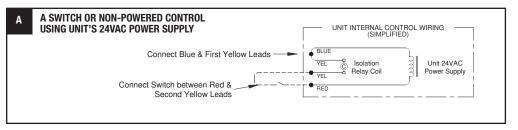
CONTROL WIRING EXAMPLES BY TYPE OF APPLICATION

A. Single 2-wire Control: Use this schematic if the control requires no power to operate and acts like a simple on/off switch. The control must not supply any power to the ERV unit. Connect the blue lead to one yellow lead. Connect the control's contacts to the red lead and the remaining yellow lead.

Control on separate Power Supply, no power present at Control Output: Wire as shown for the Single 2-wire control.

CAUTION

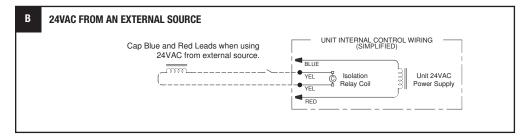
Make sure the control provides no voltage or current at its output terminals.



B. Control Sending 24VAC "On" Signal (from an external power source) to ERV: Make sure the blue and red leads are separately capped and not connected to any other wires. Now you safely can apply 24VAC to the two yellow leads to operate the ERV's isolation relay.

CAUTION

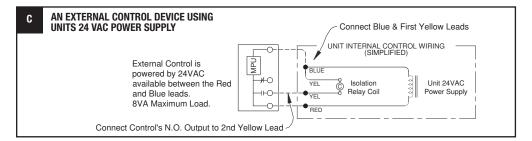
Supply only 24VAC (not VDC) from a Class II Power Source.



C. Control operating on Unit's 24VAC Power Supply: 24VAC power is available at the blue and red leads. Connect one of the yellow leads to the blue lead. Connect the switched output of the Control to the red lead to operate the ERV's isolation relay.

CAUTION

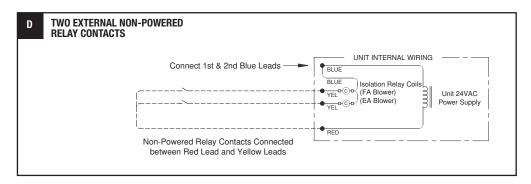
External control system should not draw more than 8VA.





D. Control System with 2 Non-powered Relay Contacts: ERVs with Independent Blower Control Only: Use this schematic if the external control system provides no voltage or current at its output contacts. Connect the two blue leads together. Connect the red lead to one side of each of the output contacts. Connect the other side of the output contacts to the appropriate yellow leads (marked "FA Blower" and "EA Blower").

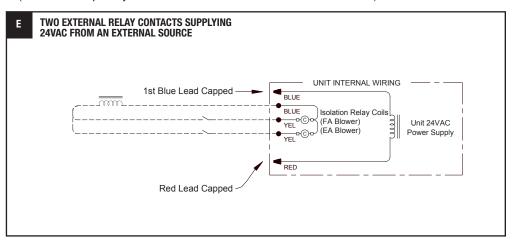




E. Control System Sending two 24VAC "On" Signals (from an external power source): ERVs with Independent Blower Control Only: Make sure the blue and red leads are separately capped and not connected to any other wires. Now you safely can apply one of the 24VAC signals to the one of the yellow leads (marked "FA Blower" and "EA Blower") and the blue lead to operate one of the ERV's isolation relay. Supply the second 24VAC signal to the other yellow lead and again to the blue lead (make sure the polarity of each wire connected to the blue lead is the same).

CAUTION

Supply only 24VAC (not VDC) from a Class II Power Source.



F. Control System Operating Isolation Dampers with End Switches: Use Isolation Dampers with electrically separate end switches. The end switches are used to separately control the ERV unit's Isolation Relays. Also, specify the ERV with Independent Blower Control. This ensures that each damper is open before the respective blower starts up.

NOTE: Because the ERV's Motor Starters will only be operating once the Dampers are open, the power draw of the Damper Actuators is allowed to be as much as 35VA while opening (including power draw of the external control system, if any). However the power draw of the fully-opened (stalled) Actuators (and external control system if any) must be less than 8VA.



START-UP

MEASURING AIR FLOW

EQUIPMENT REQUIRED

- · A magnehelic gauge or other device capable of measuring 0 to 1.5 in. water of differential pressure.
- 2 pieces of natural rubber latex tubing, 1/8" ID, 1/16" Wall works the best.

NOTE: Be sure to remove cap from pressure port before inserting tubing. Insure tubing is well seated in pressure ports.

NOTE: The tubing should extend in the pressure port approx. 1 inch.

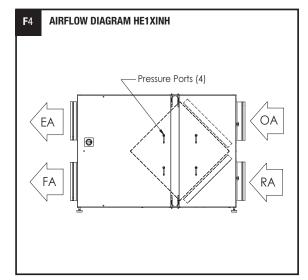
CROSS CORE STATIC PRESSURE MEASUREMENT INSTRUCTIONS

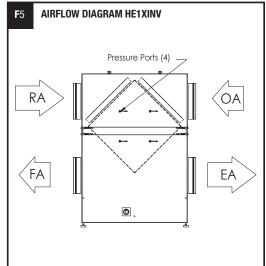
The individual differential static pressures (DSP) can be measured using the installed pressure ports located in the front of the units core access doors.

NOTE: These ports have been carefully located on the unit as to give you the most accurate airflow measurement. Do not relocate pressure ports.

- To read SCFM of Fresh Air (FA) install the "high" pressure side (+) of your measuring device to the Outside Air (OA) port and the "low" pressure side (-) to the Fresh Air (FA) port.
- To read SCFM of Room Air (RA) install the "high" pressure side (+) of your measuring device to the Room Air (RA) port and the "low" pressure side (-) to the Exhaust Air (EA) port.
- · Use the reading displayed on your measurement device to cross reference the CFM output using the conversion chart.

NOTE: Be sure to replace cap into pressure port when air flow measuring is completed.





	DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM											
>		DSP	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10
HE1 XINV	Fresh Air (FA)	CFM	280	380	470	570	670	770	860	960	1060	1160
T	Room Air (RA)	CFM	220	320	430	530	630	730	840	940	1040	1140
Ŧ		DSP	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10
HE1XINH	Fresh Air (FA)	CFM	260	360	470	570	670	770	870	970	1070	1180
工	Room Air (RA)	CFM	240	340	440	540	640	740	840	940	1040	1140

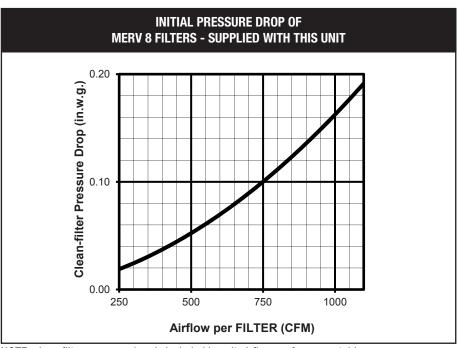


START-UP

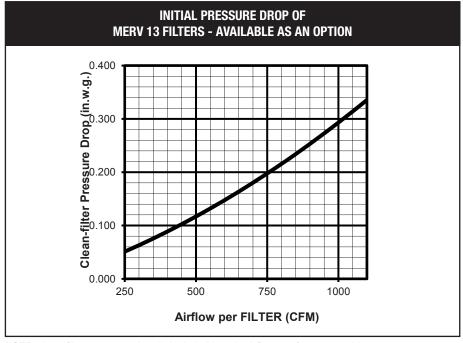
MEASURING AIR FLOW

FILTER SPECIFICATIONS

- (2) 20" x 20" x 2"(nominal) pleated filters. Actual size: 19.5" x 19.5" x 1.75"
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6



NOTE: clean filter pressure drop is included in unit airflow performance tables.

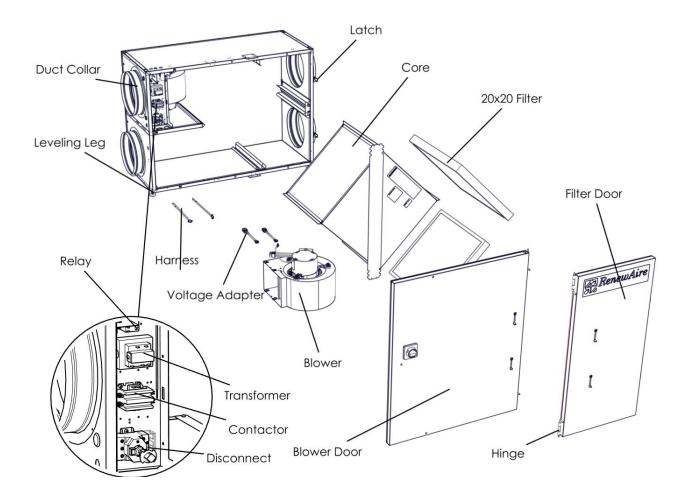


NOTE: clean filter pressure drop is included in unit airflow performance tables.



MAINTENANCE

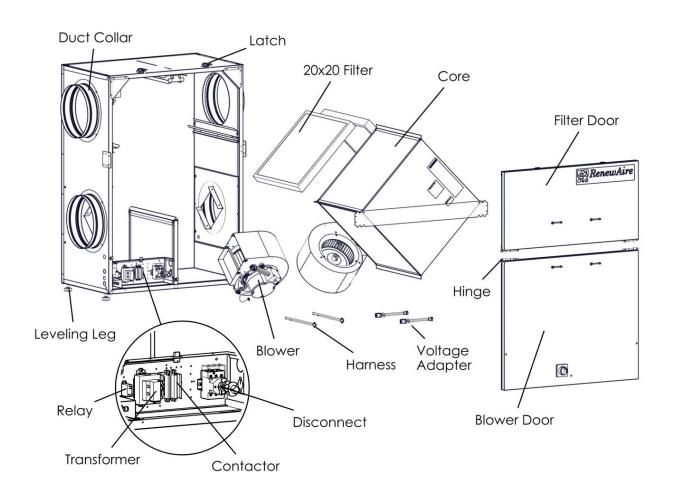
SERVICE PARTS HE1XIN(H) Horizontal Unit





MAINTENANCE

HE1XIN(V) Vertical Unit SERVICE PARTS





MAINTENANCE

REQUIREMENTS

⚠ WARNING

Danger of Electrical Shock when servicing an installed unit.

ALWAYS DISCONNECT POWER SOURCE BEFORE SERVICING! More than one disconnect switch may be required. Proper Wiring Size Selection and Wiring Installation are the Responsibility of the Electrical Contractor.

Keep your ERV performing at its best by cleaning it as described below:

CAUTION

DO NOT WASH THE ENERGY EXCHANGE CORE.

Keep it away from water or fire to avoid damaging it. Always handle the core carefully.

⚠ WARNING

Don't allow the filter access door to drop when unlatched. Injury to personnel or damage to unit may occur.

Keep fingers away from between the filter access door and the blower access panel when unlatching and opening the filter access door. Potential PINCH POINT.

TO CLEAN THE ENERGY EXCHANGE ELEMENT

Vacuum the face of the energy exchange element yearly. Dust collects only on the entering face of the energy exchange element, right where the filter sits. The interior of the energy exchange element stays clean even if the element faces are dust covered.

- 1. Remove the filters (see below)
- 2. Vacuum the exposed faces of the energy exchange element with a soft brush attachment
- 3. Vacuum out dust from the rest of the unit case
- 4. Install new filters

INSPECT AND CHANGE THE FILTERS REGULARLY.

Inspect and/or replace filters every two or three months when the HE1X is in regular use, or as needed. Filters must be used or the energy exchange core will become blocked by dust and the unit will not do its job. In extreme cases components may be damaged.

- 1. To access the filters unlatch the filter access door. The filter access door may be removed.
- 2. Remove filter keeper.
- 3. Pull the dirty filters out and replace with new filters.
- 4. Reinstall the filter keeper.

NOTE: The filters supplied in the unit are usually able to keep the energy exchange core clear for several months. Finer filters can be used but must be cleaned more often. If using finer filters, their increased resistance to flow must be allowed for in the system design.

MOTOR MAINTENANCE

The motor needs no lubrication. If necessary vacuum clean the blower wheels at the same time you clean the face of the energy exchange element (annually).

🗥 WARNING

RISK OF INJURY OR DAMAGE.

Motor may have a manual reset thermal protector. Disconnect power before servicing or resetting motor thermal protector. Use caution, motor may be hot. Allow the motor to cool before resetting the thermal protector.

If the motor thermal protector tripped, correct the issue that caused the motor to overheat (e.g. over motor rated amperage or locked rotor).

If the motor has a manual reset thermal protector, the red thermal protector reset button is located on the motor body, on or near the lead end of the motor. If the button does not reset, the motor may still be too hot. Allow the motor to fully cool to reset the thermal protector, you should feel or hear a click when the thermal protector resets while pushing the reset button.



HE1XIN

ERV

NOTES







UNMATCHED VENTILATION SUPPORT

As much as our unsurpassed quality and performance, our customers can also depend on our professional support staff for swift, professional assistance with all their technical, application, and service needs. **Every time. Anywhere.**

At RenewAire — unlike other ventilation suppliers — advanced ventilation solutions are all we do. Our sole passion. Which is why for all commercial projects, we are the "V" in HVAC... and the only name you need to know.

USA

(800) 627-4499 FAX: (608) 221-2824 4510 HELGESEN DRIVE MADISON, WISCONSIN 53718 USA WWW.RENEWAIRE.COM

CANADA

(905) 475-8989 FAX: (905) 475-5231 WWW.MITSUBISHIELECTRIC.CA

MEXICO,

CENTRAL &SOUTH AMERICA 52 (222) 2 233 911 FAX: 52 (222) 2 233 914 WWW.SOLER-PALAU.MX