

# LENNOX®

## ENGINEERING DATA

### INDOOR AIR QUALITY

# HRV/ERV

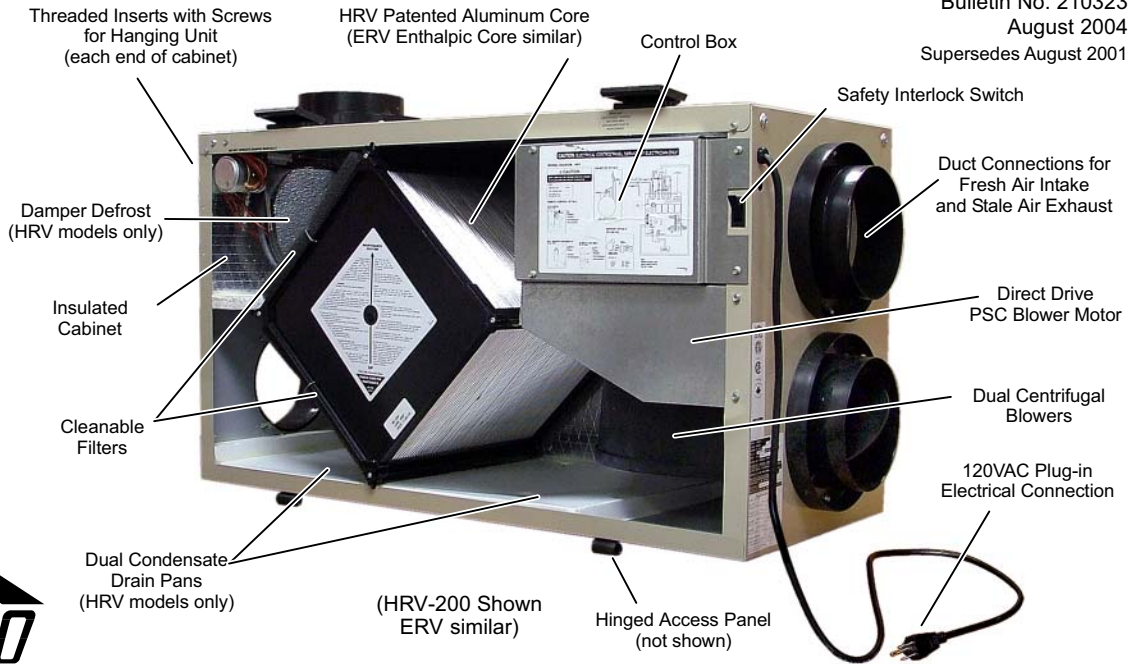
## HEALTHY CLIMATE®

### Heat / Energy Recovery Ventilators Capacity - 150 and 200 cfm

Bulletin No. 210323

August 2004

Supersedes August 2001



### MODEL NUMBER IDENTIFICATION

**HRV - 200 - 3**

Minor Revision Number

Unit Type

HRV = Heat Recovery Ventilator  
ERV = Energy Recovery Ventilator

Air Capacity in CFM  
150 = 150 cfm (71 L/s)  
200 = 200 cfm (94 L/s)

### FEATURES

#### TABLE OF CONTENTS

Application Map .....	Page 4
Dimensions .....	Pages 7
Features .....	Page 1 - 2
Model Number Identification .....	Page 1
Optional Accessories .....	Page 3
Specifications .....	Pages 5 - 6
System Applications - ERV .....	Page 9
System Applications - HRV .....	Page 8

#### APPLICATIONS

##### HRV

Heat Recovery Ventilators (HRV) provide fresh, clean outdoor air with an energy saving temperature recovery of up to 78%. HRV's are recommended in regions where normal humidity levels occur. Intake and exhaust air passes through a patented thermally conductive aluminum core where heat is transferred from exhaust air to incoming air.

##### ERV

Energy Recovery Ventilators (ERV) provide fresh clean outdoor air while reducing humidity levels at the same time. ERV's are recommended in regions where high outdoor humidity levels occur. Not recommended where outdoor temperatures fall below 25°F (-4°C) continuously for more than five days. Intake and exhaust air passes through an enthalpic core where heat is transferred from exhaust air to incoming air and moisture is reduced.

##### Both Models

Centrifugal blowers bring in fresh outdoor air while at the same time exhausting an equal amount of stale indoor air. A duct system distributes the fresh air and collects the stale air for removal from the building. System airflow must be balanced for maximum efficiency. Refer to Installation Instructions for system air flow balancing details.

##### APPROVALS

All units are CSA and Home Ventilating Institute R2000 approved and E.T.L. listed. All units conform to CAN/ULC-S110-M1986 for non-combustible material and CAN/ULC-S102-M88 for flame spread rating and smoke developed classification. Units are completely wired and include filters.

Visit us at [www.lennox.com](http://www.lennox.com)  
For the latest technical information, [www.davenet.com](http://www.davenet.com)

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.

©2004 Lennox Industries Inc.

## FEATURES

### WARRANTY

HRV aluminum core has a limited lifetime warranty in residential applications.

ERV enthalpic core has a limited warranty for five years in residential applications.

Blower motor has a limited warranty for five years in residential applications.

All other covered components have a limited warranty for seven years in residential applications.

Refer to Limited Warranty Certificate included with the equipment for more details.

### AIR FILTER

Air filters are furnished in both exhaust and intake air streams. Foam filters are easily removed for cleaning.

Design and location of filters allows maximum filtration with minimum air resistance.

### BLOWER

Dual centrifugal type with single motor.

Rubber insulated mounts furnished on all models.

Blower motor housing design allows easy access for servicing.

Multi-speed direct drive PSC motor (low, continuous low-medium and high speeds)

Low and continuous low-medium speed change available by interchanging wires on auto-transformer in electrical control box. High speed available with optional remote controls. See Optional Accessories.

High speed operation available with optional remote controls.

### CABINET

Constructed of 20 gauge pre-painted steel.

Interior is lined with foil faced polystyrene to eliminate noise, condensation and air loss.

Cabinet is designed for structural strength and long life.

Access panels are hinged, have quick release latches and can be completely removed for easy access to filter(s) and heat exchanger(s) for servicing.

Safety interlock switch disconnects automatically shuts off power to unit when access panel is opened.

Patented self-locking balancing damper allows system airflow equalization.

Threaded inserts with screws are furnished on cabinet for hanging unit with furnished PVC reinforced polyester rubber straps.

Condensate drain pans have drain connection (HRV model).

### CORE ASSEMBLY

#### HRV Patented Aluminum Core

Aluminum plates have excellent heat transfer characteristics, are nonflammable, corrosion resistant and durable.

Plates are mounted in stainless steel frame and are easily removable for cleaning.

Opposed dimples pressed into each plate ensure proper separation within each core.

Modular design ensures ease of service.

#### ERV Enthalpic Core

Enthalpic core has excellent latent and sensible heat transfer characteristics, are nonflammable, corrosion resistant and durable.

Plates are mounted in a frame and are easily removable for cleaning.

Opposed dimples pressed into each plate ensure proper separation within each core.

Modular design ensures ease of service.

### ELECTRICAL

#### Control Box

Contains control circuit board and auto-transformer.

Circuit board controls operation of unit.

Various operation modes are available by changing jumpers on board.

Terminal strip furnished for connection of remote controls (ERV remote control, HRV dehumidistat and timer).

#### Plug-in Electrical Connection

Convenient 3 prong 120VAC plug provided for easy electrical connection.

### CONTROLS

#### Damper Defrost (HRV Models Only)

During a defrost cycle the damper opens permitting inside air to defrost the core while closing off outdoor air at the same time.

Automatic damper defrost occurs when outdoor temperature drops below 25°F (-4°C).

Blower operates on high speed during defrost cycle.

Consists of 3 minute defrost cycle with 17 minute waiting period in between defrost cycles (waiting period adjustable - 17, 25 or 30 minutes).

#### HRV Remote Wall Mount Dehumidistat (Furnished)

Low voltage control designed for central locations.

On/Off switch, dehumidistat, service reminder LED

Ventilation control turns HRV system on and off.

Adjustable from 20 to 80% relative humidity.

Dehumidistat increases ventilation when required.

Blower operates on high speed during dehumidification.



#### ERV Remote Control (Furnished)

Low voltage control designed for central locations.

On/Off switch, service reminder LED

Ventilation control turns ERV system on and off.



#### Interlock Capability

Built-in function on circuit board.

Allows ERV/HRV to operate whenever furnace or air handler is operating.

Refer to Installation Instructions for interlocking HRV/ERV to Furnace or Air Handler.

## OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

### CONTROLS

#### 20 Minute Fan Timer

Remotely located timer allows 20 minute high speed operation.  
One-touch button.  
LED shows timer status.  
Maximum wire length 100 ft. (30 m)  
Up to four timers can be used with one HRV/ERV unit.



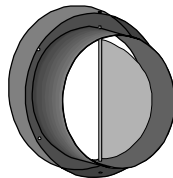
#### Wall Mount Dehumidistat (For HRV Units Only)

Remote mounted control turns HRV system on and off.  
Scaled in relative humidity from 20% to 80%; 24VAC  
Allows high speed operation when required.  
White decorator color.  
Complete with 60 ft. (18 m) length of 3 wire control cable.



### AIR BALANCING TOOLS

#### Balancing Damper - 6 in. (152 mm)



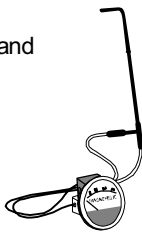
#### Digital Manometer

Measures positive, negative or differential pressures of air and gasses. Range: 1 in. w.c. to 150 psid.  
Large easy to read LCD display.  
Lightweight, extruded aluminum case.  
Standard 9-volt battery operation (furnished).  
Low battery indicator.  
Piezoresistive pressure sensor  
Standard dual size connectors (1/8 in. or 3/16 in.)



#### Pitot Tube Air Flow Balancing Kit

Includes magnehelic gauge, Pitot tube, hose and carrying case.



#### Pitot Tube Only



### DUCTWORK

#### Flexible Ducts - Insulated or Non-Insulated

Non-insulated ducts are available for connection to optional circular grilles.

Constructed of aluminum foil/polyester laminate and metalized polyester film around a steel wire helix.

Fully insulated fiberglass ducts have an "R" value of 5.8 and are available for connection to optional outside weatherhoods.

Available for inside use in standard 3 to 10 in. (76 to 254 mm) diameters and 25 ft. (7.6 m) lengths.

Underwriter's Laboratories Canada (ULC) listed Class 1 Duct.



#### Hinged Kitchen Exhaust Grille

Louvered panel is hinged for easy access to washable aluminum filter.

Size - 6 x 10 in. (152 x 254 mm) in white .



#### Round Diffusers

White molded plastic grilles are available for room distribution.

Grilles are adjustable for system balancing. Available in 4 in, 6 in. and 8 in. (102 mm, 152 mm and 203 mm) diameters.



#### Weatherhood Kit

Two furnished per order no., one for intake air and one for stale air.

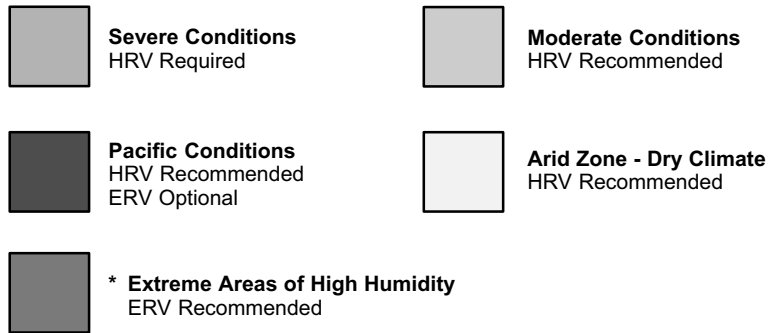
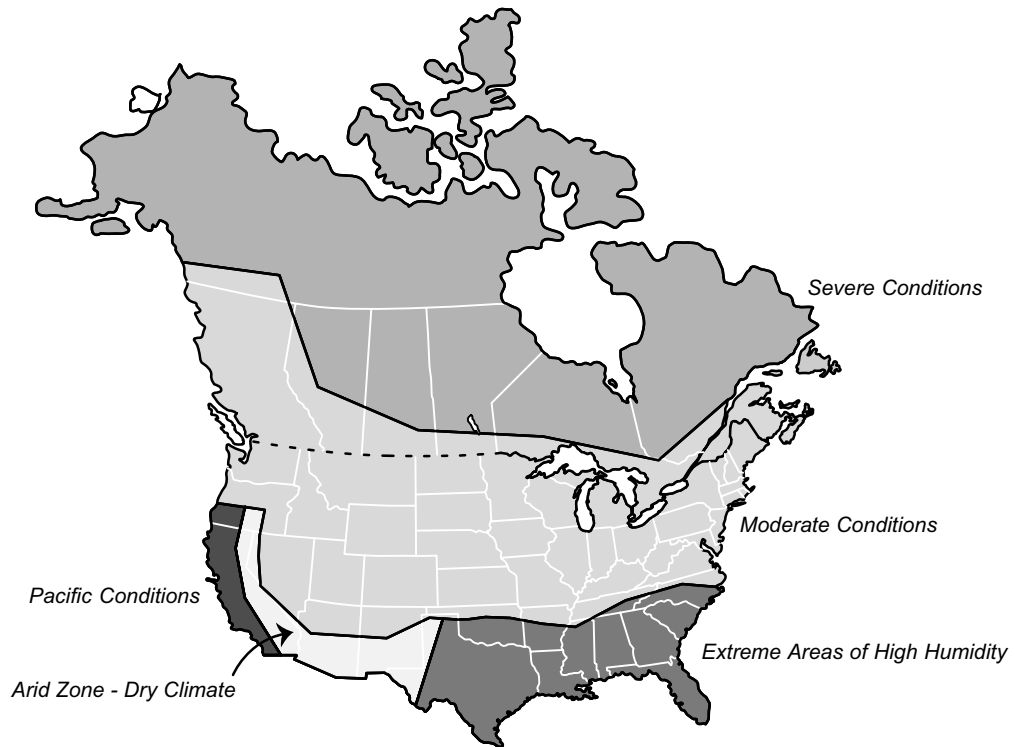
Fully adjustable for different wall thickness.

Complete with mesh bird screen and (2) insulating duct collars.

Hinged hood allows easy cleaning of screen.  
White finish.



# APPLICATION MAP



**NOTE** ERV not recommended where temperatures fall below 25°F (-4°C) continuously for more than 5 days.  
**\*ERV** not recommended in regions where high outdoor humidity causes air conditioning operation for dehumidification more frequently than heating system operation.

## SPECIFICATIONS - HRV

Performance		Model No.	HRV-150	HRV-200
	Maximum sensible effectiveness -13°F (-25°C) outdoor air, 72°F (22°C) 40% RH indoor air		78%	69%
	Sensible effectiveness @ 32°F (0°C)		76%	67%
	Sensible efficiency (thermal) @ 32°F (0°C)		66%	60%
	Sensible efficiency (thermal) @ -13°F (-25°C)		60%	59%
	Latent efficiency (moisture) 95°F (35°C)		0%	0%
	Total efficiency 95°F (35°C)		20%	20%
Blower	Air Flow vs. Static Pressure (At High Speed) - in. wg (Pa)		cfm (L/s)	cfm (L/s)
	0.1 (25)		189 (89)	203 (96)
	0.2 (50)		182 (86)	198 (93)
	0.3 (75)		175 (83)	190 (90)
	0.4 (100)		165 (78)	181 (85)
	0.5 (125)		150 (71)	170 (80)
	Number of Speeds Available		3	3
Defrost type			Damper	Damper
Ducts	Duct Connections (No.) & diameter - inch (mm)		(2) 6 (152) outside (2) 6 (152) inside (1) 6 (152) defrost	(2) 6 (152) outside (2) 6 (152) inside (1) 6 (152) defrost
Condensate drain connection (o.d.) - in. (mm)			(2) 1/2 (13)	(2) 1/2 (13)
Electrical			120 volts - 60 hertz - 1 phase	
	Fan Watts - high speed @ .3 in. w.g. (75 Pa)		173	182
	Fan Watts - low-medium speed @ .3 in. w.g. (75 Pa)		93	93
	Fan Watts - low speed @ .3 in. w.g. (75 Pa)		63	70
Shipping weight - lbs. (kg)			78 (35)	78 (35)
OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA				
Air Balancing Tools	Balancing Damper - 6 in. (152 mm)		<b>91X09</b>	<b>91X09</b>
	Digital Handheld Manometer		<b>86N62</b>	<b>86N62</b>
	Pitot Tube with Air Balancing Kit		<b>56N82</b>	<b>56N82</b>
	Pitot Tube only		<b>72X52</b>	<b>72X52</b>
Controls	20 Minute Fan Timer		<b>89N18</b>	<b>89N18</b>
	Wall Mount Dehumidistat		<b>27N53</b>	<b>27N53</b>
<sup>1</sup> Flexible Ducts - No. required & diameter - in. (mm)			(2) 6 (152)	(2) 6 (152)
Hinged Kitchen Exhaust Grille (filter included)			<b>18N48</b>	<b>18N48</b>
Round Diffusers	4 in. (201 mm) diameter		<b>72N59</b>	<b>72N59</b>
	6 in. (152 mm) diameter		<b>72N60</b>	<b>72N60</b>
	8 in. (203 mm) diameter		<b>72N65</b>	<b>72N65</b>
Weatherhood Kit (2 furnished per order no.)			<b>95P07</b>	<b>95P07</b>

NOTE - Effectiveness is based on temperature difference between the 2 airstreams.  
Efficiency includes parasitic losses from fan operation and defrost cycles.

<sup>1</sup> Contact your territory Manager for additional information.

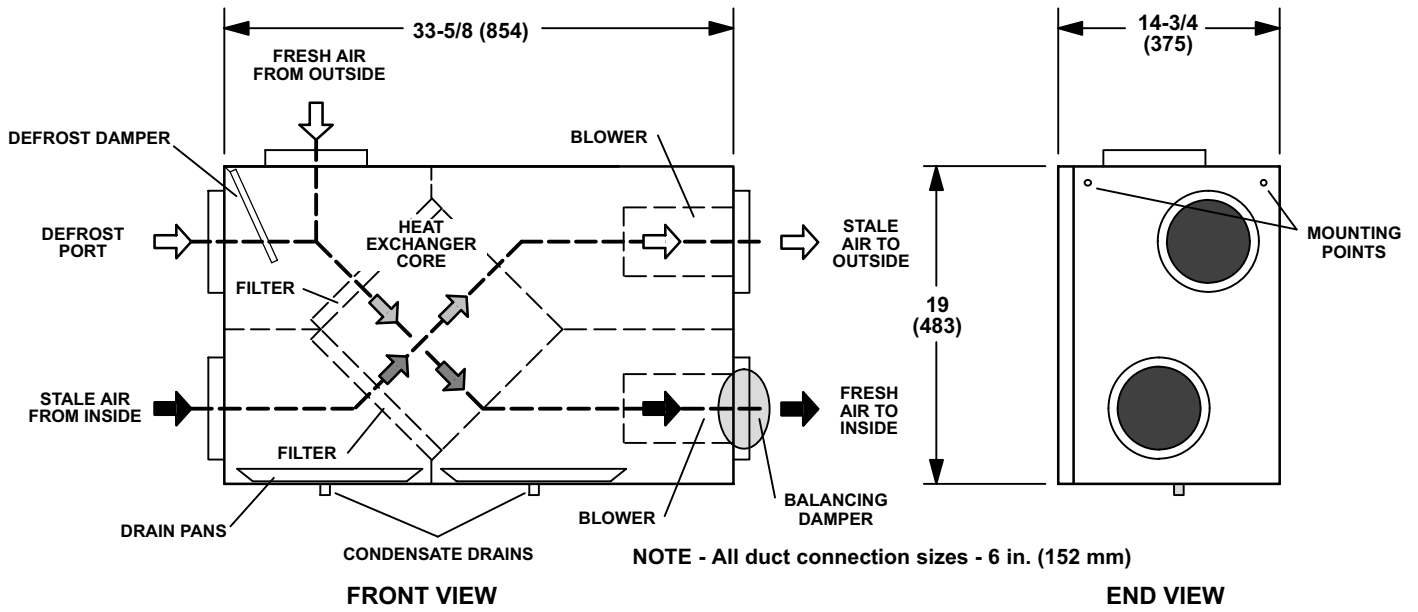
## SPECIFICATIONS - ERV

Performance		Model No.	ERV-150	ERV-200
	Sensible effectiveness @ 32°F (0°C)		76%	67%
	Sensible efficiency (thermal) @ 32°F (0°C)		66%	60%
	Latent efficiency (moisture) 95°F (35°C)		27%	27%
	Total efficiency 95°F (35°C)		50%	50%
<b>Blower</b>	Air Flow vs. Static Pressure (At High Speed) - in. wg (Pa)		<b>cfm (L/s)</b>	<b>cfm (L/s)</b>
	0.1 (25)		189 (89)	203 (96)
	0.2 (50)		180 (85)	198 (93)
	0.3 (75)		173 (82)	190 (90)
	0.4 (100)		165 (79)	181 (85)
	0.5 (125)		153 (72)	170 (80)
	Number of Speeds Available		3	3
<b>Ducts</b>	Duct Connections (No.) & diameter - inch (mm)		(2) 6 (152) outside (2) 6 (152) inside	(2) 6 (152) outside (2) 6 (152) inside
<b>Electrical</b>			120 volts - 60 hertz - 1 phase	
	Fan Watts - high speed @ .3 in. w.g. (75 Pa)		173	182
<b>Electrical</b>	Fan Watts - low-medium speed @ .3 in. w.g. (75 Pa)		93	93
<b>Electrical</b>	Fan Watts - low speed @ .3 in. w.g. (75 Pa)		63	70
<b>Shipping weight - lbs. (kg)</b>			78 (35)	78 (35)
<b>OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA</b>				
<b>Air Balancing Tools</b>	Balancing Damper - 6 in. (152 mm)		<b>91X09</b>	<b>91X09</b>
	Digital Handheld Manometer		<b>86N62</b>	<b>86N62</b>
	Pitot Tube with Air Balancing Kit		<b>56N82</b>	<b>56N82</b>
	Pitot Tube only		<b>72X52</b>	<b>72X52</b>
<sup>1</sup> Flexible Ducts - No. required & diameter - in. (mm)			(2) 6 (152)	(2) 6 (152)
<b>Hinged Kitchen Exhaust Grille (filter included)</b>			<b>18N48</b>	<b>18N48</b>
<b>Round Diffusers</b>	4 in. (201 mm) diameter		<b>72N59</b>	<b>72N59</b>
	6 in. (152 mm) diameter		<b>72N60</b>	<b>72N60</b>
	8 in. (203 mm) diameter		<b>72N65</b>	<b>72N65</b>
<b>20 Minute Fan Timer</b>			<b>89N18</b>	<b>89N18</b>
<b>Weatherhood Kit (2 furnished per order no.)</b>			<b>95P07</b>	<b>95P07</b>

NOTE - Effectiveness is based on temperature difference between the 2 airstreams.  
Efficiency includes parasitic losses from fan operation.

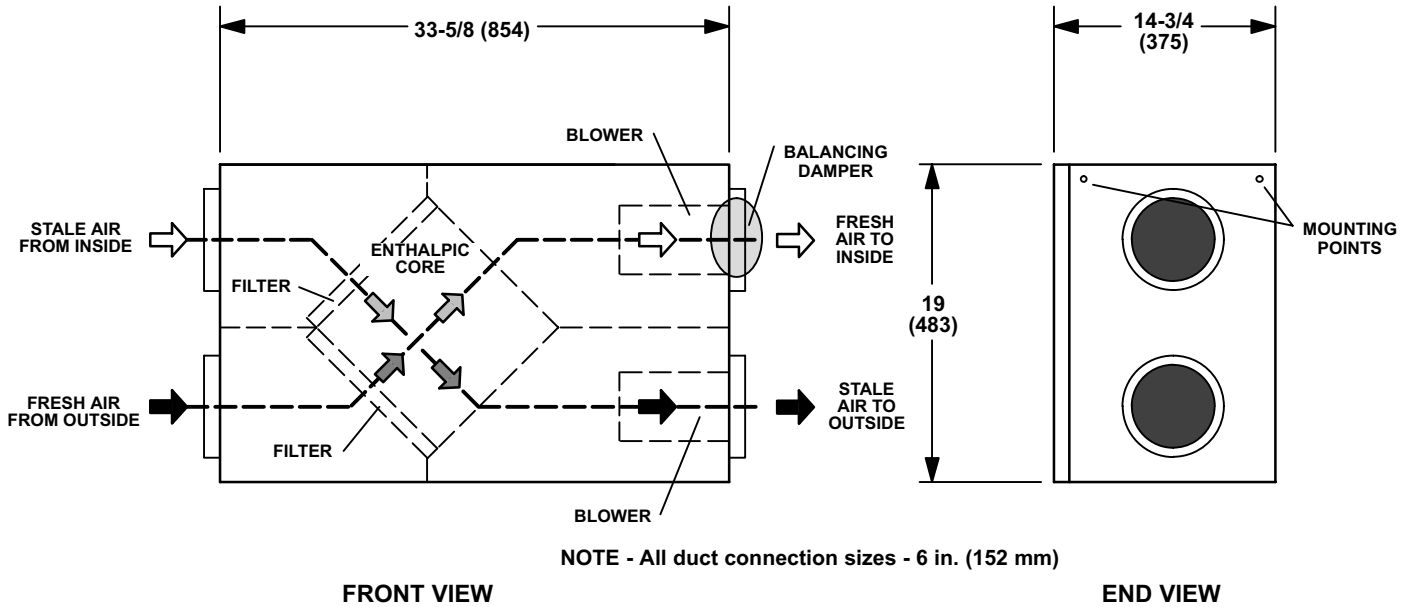
<sup>1</sup> Contact your territory Manager for additional information.

**HRV SERIES HEAT RECOVERY MODELS**



NOTE — Front clearance of 25 inches (635 mm) is recommended for servicing unit.

**ERV SERIES ENERGY RECOVERY MODELS**

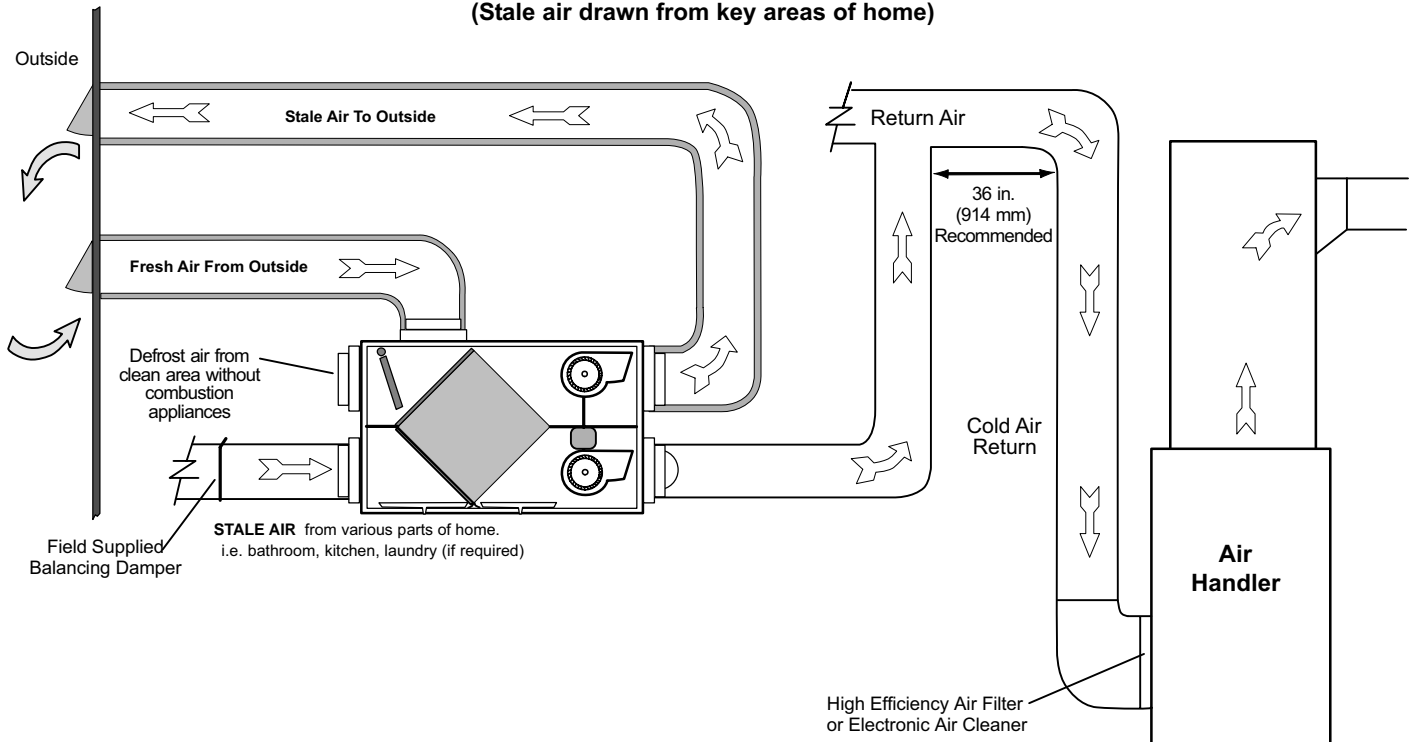


NOTE — Front clearance of 25 inches (635 mm) is recommended for servicing unit.

# HRV SYSTEM APPLICATIONS

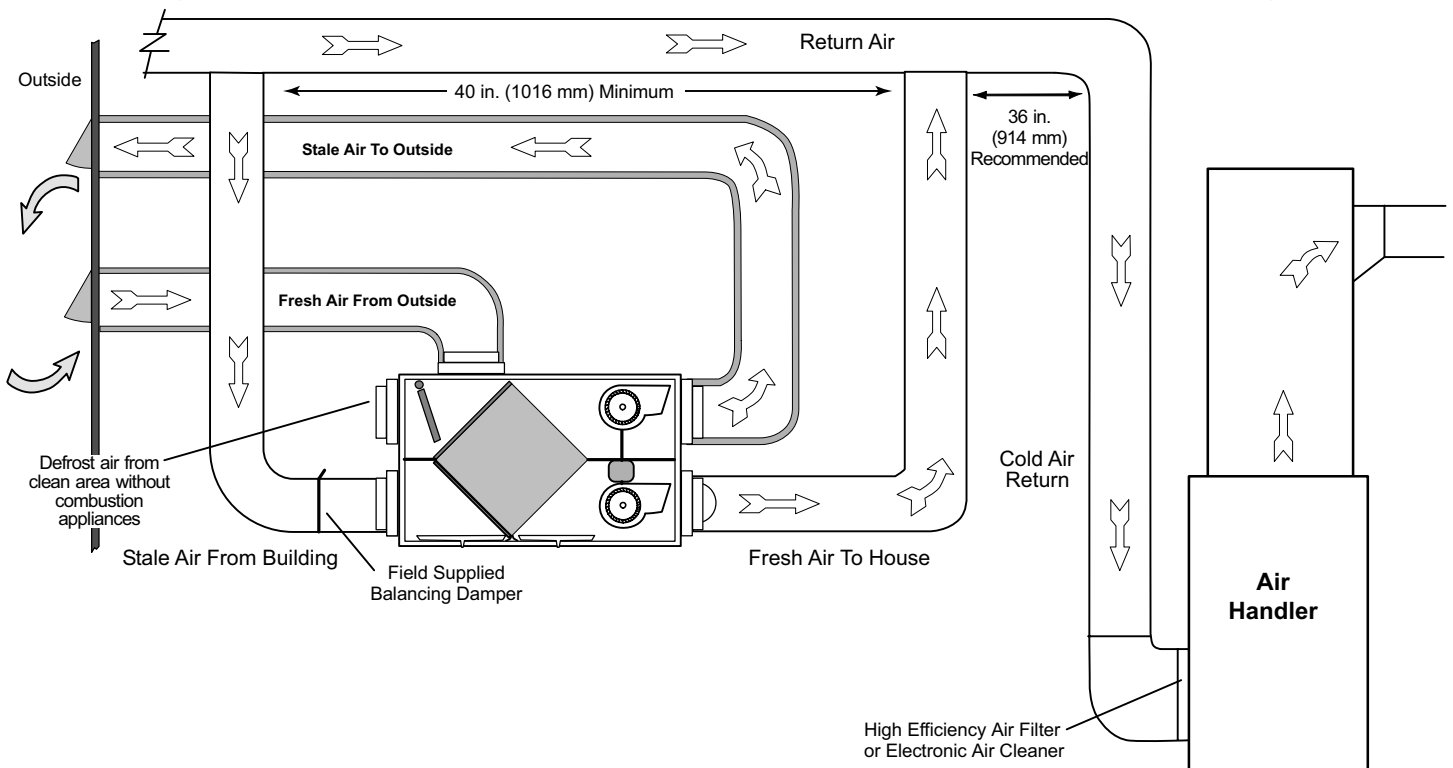
## HRV PARTIALLY DEDICATED SYSTEM INSTALLATION

(Direct connection of HRV supply air stream to the air handler cold air return)  
(Stale air drawn from key areas of home)



## HRV SIMPLIFIED INSTALLATION (Return/Return Method)

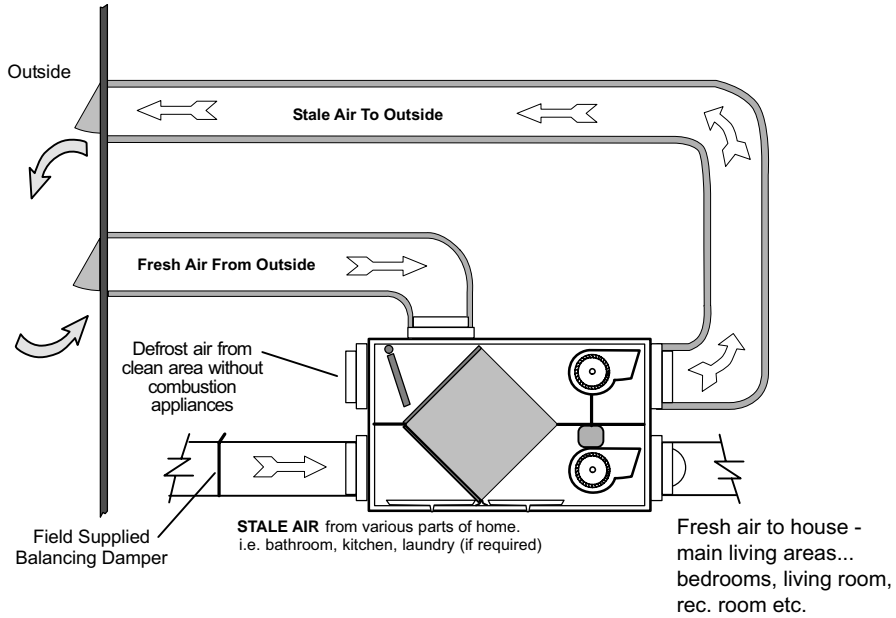
(Direct connection of both HRV supply and exhaust air streams to the air handler cold air return)



## HRV SYSTEM APPLICATIONS

### HRV FULLY DEDICATED SYSTEM INSTALLATION

(Fresh air supplied to main living areas of house. Stale air drawn from key areas of home)

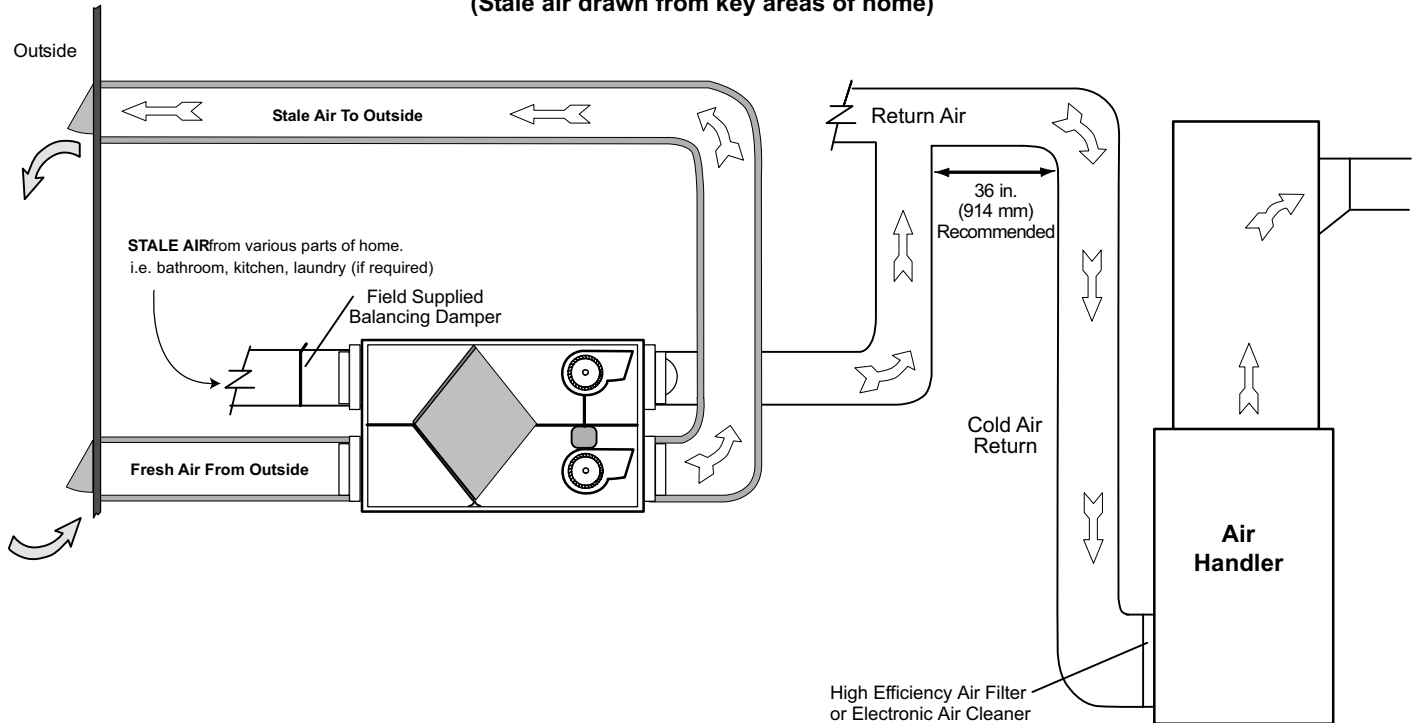


## ERV SYSTEM APPLICATIONS

### ERV PARTIALLY DEDICATED SYSTEM INSTALLATION

(Direct connection of ERV supply air stream to the air handler cold air return)

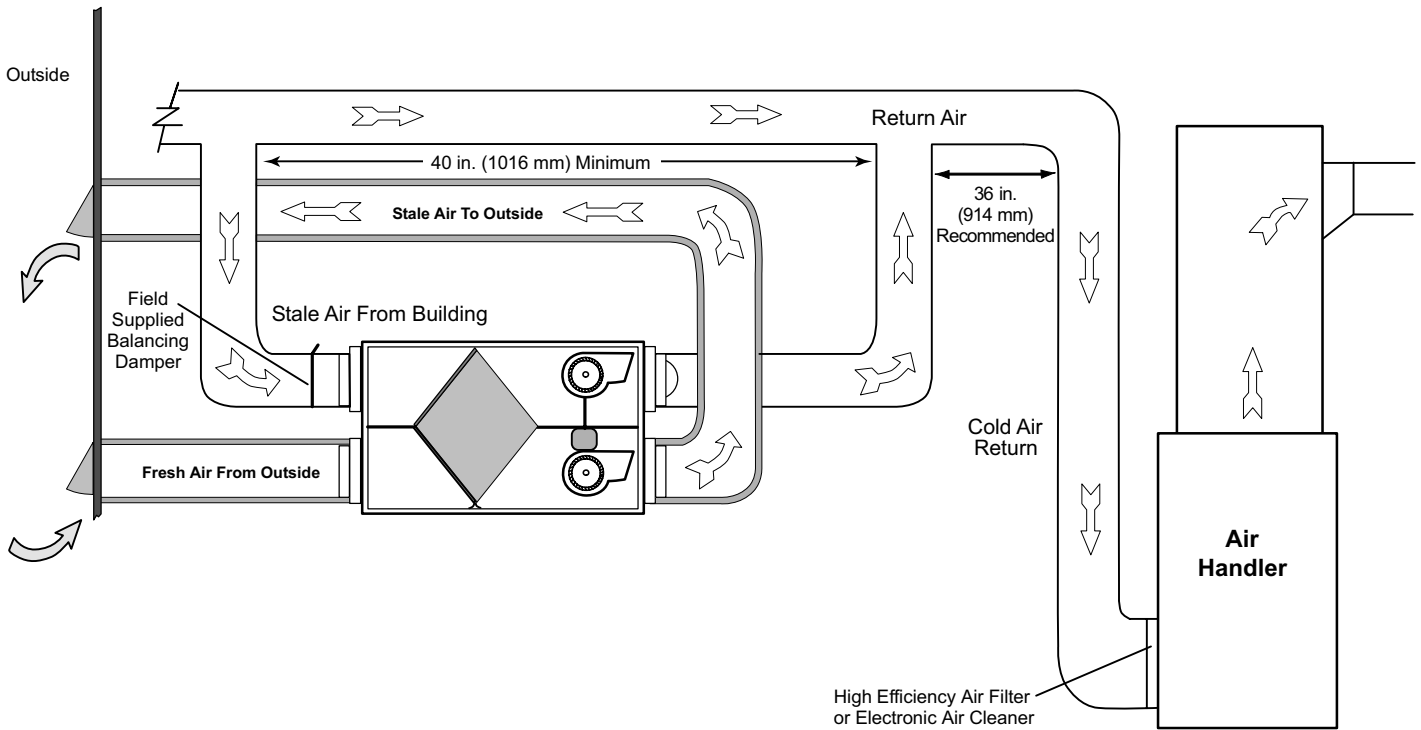
(Stale air drawn from key areas of home)



# ERV SYSTEM APPLICATIONS

## ERV SIMPLIFIED INSTALLATION (Return/Return Method)

(Direct connection of both ERV supply and exhaust air streams to the air handler cold air return)



## ERV FULLY DEDICATED SYSTEM INSTALLATION

(Fresh air supplied to main living areas of house. Stale air drawn from key areas of home)

