

## Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

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## Shipping and Packing List

Package 1 of 1 contains:

1 - Assembled ventilator

1 - Accessories Bag assembly contains the following:

**Table 1. Accessories Bag Assembly Contents**

UNIT NAME	CONTENTS
ASSURE120	1x Ventilations Label 4x Mounting Brackets 8x Screws 1x Electrical Box Cover*
ASSURE140	1x Ventilations Label 4x Mounting Brackets 8x Screws 1x Terminal Block Connection 1x 90° Elbow Conduit Connection*

\* Provided for Hardwired variations only.

## General Information

This instruction is intended as a general guide and does not supersede local codes in any way

Consult authorities who have jurisdiction before installation.

## Unit Name and Descriptions

**Table 2. Model Number and Descriptions**

UNIT NAME	DESCRIPTION	MOUNTING
ASSURE120	50-130 CFM compact, affordable Energy Recovery Ventilator with side ports designed for ceiling mounting in single family or multi unit residential buildings. Fan defrost unit with no balancing* or drains required. Offered in standard, mirrored, hardwired or corded configurations.	Ceiling
ASSURE140	30-160 CFM Cold weather certified, compact high efficiency Energy Recovery Ventilator with side ports designed for ceiling or wall mounting in single family or multi unit residential buildings. Fan defrost unit with no drains. Offered in standard, mirrored, hardwired or corded configurations.	Ceiling or Wall

\* - See "Balancing The Airflows" on page 28.

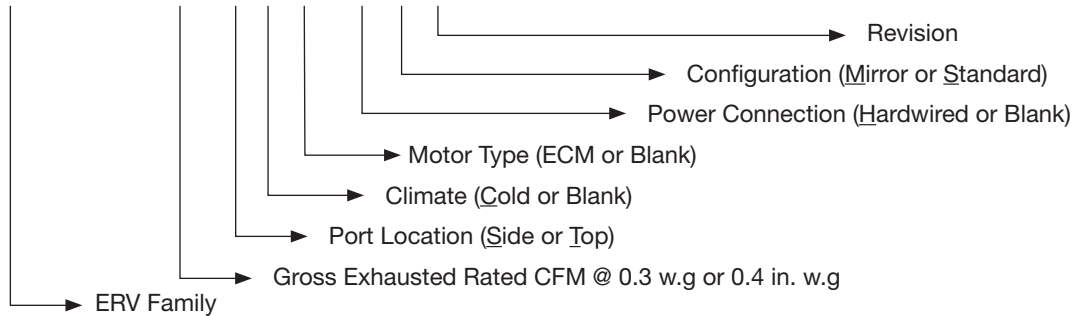
### **WARNING**

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 licensed professional HVAC installer (or equivalent) or a service agency.

## Model Number Nomenclature Breakdown

Example Model Number:

# ASSURE-140SC – HM1



## Terms and Definitions

- **ERV** - Energy Recovery Ventilator.
- **Defrost Mode** - to ensure reliable operation during cold weather, the ERV will automatically cycle through its defrost mode as needed.
- **Dehumidistat** - a control device that senses the amount of moisture in the air and activates high-speed ventilation when the air moisture level exceeds the setpoint.
- **Reset** - whenever resetting of the ERV is required, simply unplug the power cord for 30 seconds. The Self-Test will occur when the ERV is reconnected.
- **Self-Test** - each time the ERV is powered/energized, the self-test function will automatically initiate. During the self-test, the ERV will cycle through all the speeds available (1 – 5), test the damper motor operation, and will default back to the previous operational mode and speed selection. Total self-test duration is approximately 90 seconds.
- **Standby Mode** - the ERV is powered/energized and waiting for fan operation to be initiated. For example, the ERV is set to Continuous Ventilation Operation Mode at speed 0.
- **Thermistor** - This is the temperature sensor that measures electrical resistance as outdoor temperatures fluctuate.
- **HVI** - Home Ventilating Institute.
- **HRAI** - Heating Refrigeration Air Conditioning Institute.

## Application

This equipment is designed to provide fresh air while exhausting an equal amount of stale air. The ERV unit is equipped with an enthalpic core. The ERV unit transfers both sensible (temperature) and latent (moisture) between incoming fresh air and exhausting stale air.

### CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

## Required Tools and Materials

Field Provided Material

- Low voltage control wire
- Mastic tape
- Caulking material
- Aluminum foil duct tape
- Zip ties (duct)
- Flexible or rigid, insulated or non-insulated ducts - class II rated zip ties

### CAUTION

Potential equipment malfunction or damage. May require repairs and/or void warranty. Do not interconnect ERV to other appliances such as Stove Vents, Clothes Dryer Vents, Central Vacuum Systems, Auxiliary Fans, etc.

# Specifications

**Table 3. Specifications**

Specifications	Single-Core ERV Units	
Model No.	ASSURE120	ASSURE140
Unit Weight in pounds (kilograms)	34 (15)	42 (19)
Unit Dimensions	Refer to “Dimensional Drawings” on page 7.	
	High Speed (HVI Certified)	
Inches wg (Pa)	CFM (L/s)	CFM (L/s)
0.1 (25)	138 (65)	161 (76)
0.2 (50)	133 (63)	150 (71)
0.3 (75)	129 (61)	140 (66)
0.4 (100)	125 (59)	127 (60)
0.5 (125)	119 (56)	117 (55)
0.6 (150)	114 (54)	106 (50)
0.7 (175)	108 (51)	93 (44)
0.8 (200)	102 (48)	81 (38)
0.9 (225)	93 (44)	68 (32)
1.0 (250)	85 (40)	55 (26)
Adjusted Sensible Recovery Efficiency @ 32°F (0°C)*	@ 49 CFM (23 L/s) 78%	@ 64 CFM (30 L/s) 83%
Sensible Recovery Efficiency @ 32°F (0°C)*	@ 49 CFM (23 L/s) 69%	@ 64 CFM (30 L/s) 77%
Adjusted Sensible Recovery Efficiency @ -13 °F (-25°C)*	N/A	@ 70 CFM (33 L/s) 66%
Sensible Recovery Efficiency @ -13°F (-25°C)*	N/A	@ 70 CFM (33 L/s) 63%
Latent Efficiency 95°F (35°C)*	@ 49 CFM (23 L/s) 44%	@ 64 CFM (30 L/s) 54%
Total Efficiency 95°F (35°C)*	@ 49 CFM (23 L/s) 45%	@ 64 CFM (30 L/s) 53%
*Certified by the Home Ventilating Institute (HVI) according to test procedures developed by HVI members and based on internationally recognized standards. For performance ratings at other conditions not shown, please visit the HVI website.		
Number of speeds available with Two-Speed Switch with Humidity Sensor (435245)	2	2
Number of speeds available with Two-Speed Switch with Intermittent Mode (435246)	2	2



# Specifications

**Table 3. Specifications (continued)**

Specifications	Single-Core ERV Units	
Model No.	ASSURE120	ASSURE140
Number of speeds available with PrecisionSYNC Control (435244)	5	5
Ventilator Type	Energy Recovery	Energy Recovery
Energy Recovery Core	Enthalpic	Enthalpic
Defrost Type	Fan	Fan
Balancing	N/A	N/A
Number of Ports	4	4
Pre-Filters Supply & Exhaust	MERV 6 or MERV 13**	
	** To be ordered separately. Comes in a set of 4 and is installed in the Fresh Side only. When a MERV 13 filter is installed for the first time, airflow will need to be balanced.	
Condensate Drain Connections: Spouts: qty. 2 (1/2" o.d.) Drain Tee: qty. 1 (1/2" o.d.)	No	No
Drain Plug Included	No	No
Hanging Strap kit Included	No	No
Mounting Brackets Included	Yes	Yes
Electrical Characteristics: 120 Volts, 60 Hertz, 1 phase		
Motor type	PSC	PSC
*Fan watts @ HVI Test 32°F (0° C)	@ 49 CFM (23 L/s), 60W	@ 64 CFM (30 L/s), 77W
Fan Watt Rating	160	104
Amp Rating	1.4	0.9
<p>* Certified by the Home Ventilating Institute (HVI) according to test procedures developed by HVI members and based on internationally recognized standards. For performance ratings at other conditions not shown, please visit the HVI website.</p>		

# Optional Fan Curve Speeds

**Table 4. Optional Fan Curves Speeds (Factory Tested)**

Single-Core ERV Units

Model No.	ASSURE120		ASSURE140	
Speed 5 - High				
IN. WG (PA)	CFM	L/s	CFM	L/s
0.1 (25)	138	65	161	86
0.2 (50)	133	63	150	71
0.3 (75)	129	61	140	66
0.4 (100)	125	59	127	60
0.5 (125)	119	56	117	55
0.6 (150)	114	54	106	50
0.7 (175)	108	51	93	44
0.8 (200)	102	48	81	38
0.9 (225)	93	44	68	32
1.0 (250)	85	40	55	26
Speed 4 - Medium High				
IN. WG (PA)	CFM	L/s	CFM	L/s
0.1 (25)	117	55	129	61
0.2 (50)	112	53	118	56
0.3 (75)	108	51	107	51
0.4 (100)	103	48	97	46
0.5 (125)	97	46	86	40
0.6 (150)	92	43	75	35
0.7 (175)	87	41	64	30
0.8 (200)	80	38	53	25
0.9 (225)	72	34	42	20
1.0 (250)			31	15
Speed 3 - Medium				
IN. WG (PA)	CFM	L/s	CFM	L/s
0.1 (25)	100	47	110	52
0.2 (50)	95	45	99	47
0.3 (75)	91	43	89	42
0.4 (100)	89	42	78	37
0.5 (125)	85	40	67	32
0.6 (150)	80	38	57	27
0.7 (175)	75	35	46	22
0.8 (200)			36	17
Speed 2 - Medium Low				
IN. WG (PA)	CFM	L/s	CFM	L/s
0.1 (25)	86	40	87	41
0.2 (50)	82	39	77	36
0.3 (75)	79	37	68	32
0.4 (100)	74	35	58	27
0.5 (125)	69	32	48	23
0.6 (150)	64	30	39	18
0.7 (175)	57	27	29	14
Speed 1 - Low				
IN. WG (PA)	CFM	L/s	CFM	L/s
0.1 (25)	69	32	67	32
0.2 (50)	66	31	57	27
0.3 (75)	62	29	47	22
0.4 (100)	60	28	36	17
0.5 (125)	54	25	26	12
0.6 (150)	44	21		



# Dimensional Drawings

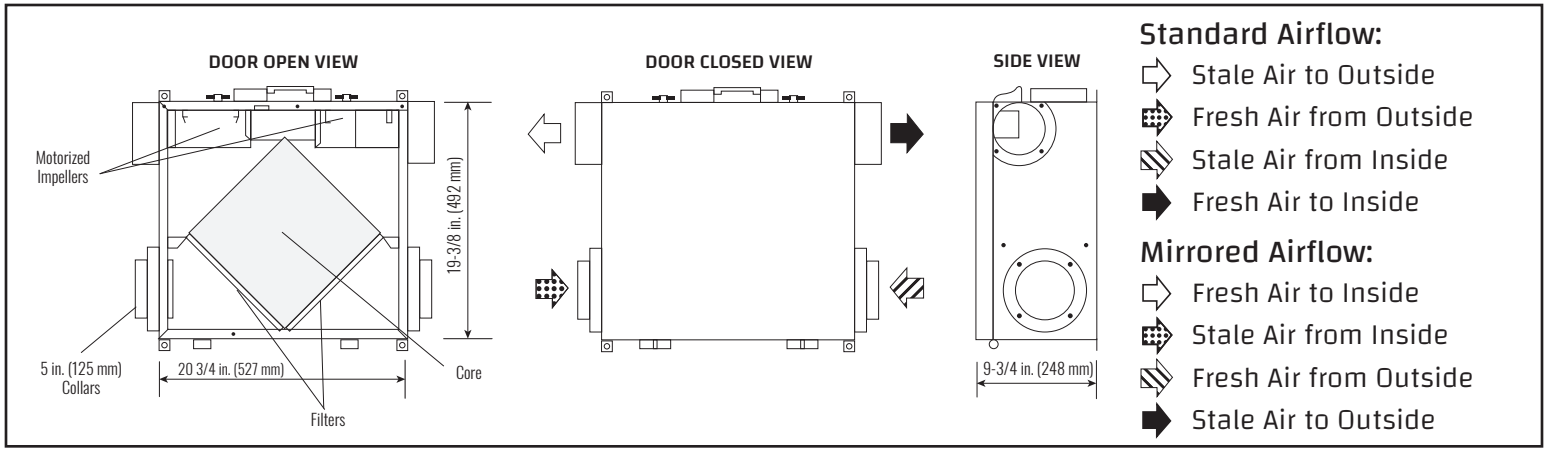


Figure 1. ASSURE120 dimensional drawing

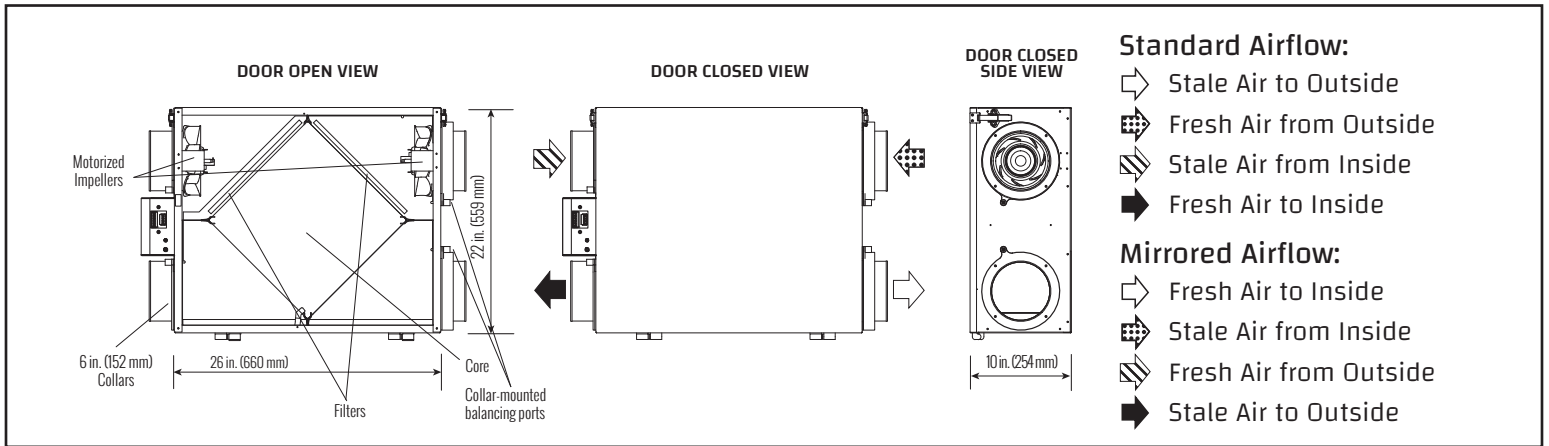


Figure 2. ASSURE140 dimensional drawing

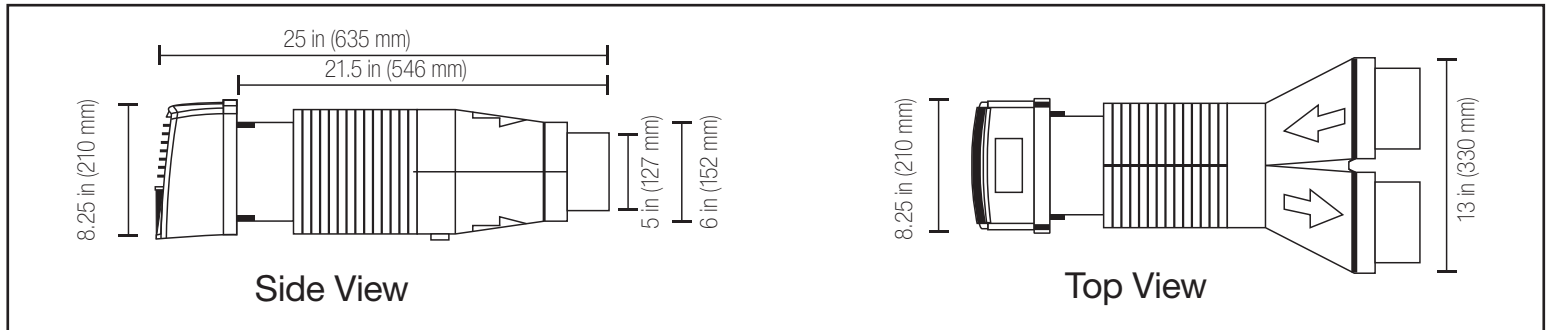


Figure 3. Dual Intake and Exhaust Hoods

## Defrost Cycle

The ERV has an electronically controlled defrost system. The defrost cycle is activated when the outdoor temperature drops below 27°F (-3°C). Incoming fresh air temperature is constantly measured to determine if defrost is required. The three defrost settings are:

- At 27°F (-3°C) ERV runs in defrost for 3 minutes and runs in ventilation for 25 minutes
- At -4°F (-20°C) ERV runs in defrost for 4.5 minutes and runs in ventilation for 17 minutes
- At -31°F (-35°C) ERV runs in defrost for 7 minutes and runs in ventilation for 15 minutes

No remote device can override this defrost mode until the cycle is complete. After the cycle is completed, the ERV defaults to previous settings. If the cycle is completed and the thermistor continues to measure defrost temperature the defrost cycle is repeated.

## Fan Defrost

During defrost the supply fan shuts off while the exhaust fan continues to operate. This allows the heat from the exhaust air to defrost the unit's core. During the defrost portion of the cycle, the unit operates with only exhaust ventilation. After the defrost portion of the cycle, the supply fan powers on and operates with balanced ventilation. The defrost cycle repeats until the temperature rises above 27°F (-3°C).



# Required Ventilation

## ASHRAE

- ASHRAE 62.2-2019 is a national standard that provides methods for achieving acceptable indoor air quality in typical residences. It was developed and is maintained by the American Society of Heating and Air-Conditioning Engineers (ASHRAE).
- This standard recommends Dwelling-Unit Ventilation, which is a mechanical exhaust system, supply system, or combination thereof.

## Formula Method

The Building Ventilation rate is determined based on the floor area and the number of bedrooms, as defined in Section 4.1.1 equation 4-1a.

### Formula:

$$(\text{Square feet} \times 0.03) + (\text{bedrooms} + 1) \times 7.5 = 97.5$$

$$(2000 \times 0.03) + (4+1) \times 7.5 = 97.5$$

## Table Method

Example: a 2000 square foot building with 4 bedrooms from Section 4.1.1 Table 4-1a, a quick reference table predicts 98 cfm. The following table complies with ASHRAE Standard 62.2-2019, Section 4.1.1 Table 4-1a, Continuous Whole-Building Ventilation rate in cfm.

Floor Area (Square Feet)	Number of Bedrooms				
	1	2	3	4	5
	CFM	CFM	CFM	CFM	CFM
<500	30	38	45	53	60
501 - 1000	45	53	60	68	75
1001 - 1500	60	68	75	83	90
1501 - 2000	75	83	90	98	105
2001 - 2500	90	98	105	113	120
2501 - 3000	105	113	120	128	135
3001 - 3500	120	128	135	143	150
3501 - 4000	135	143	150	158	165
4001 - 4500	150	158	165	173	180
4501 - 5000	165	173	180	188	195

For more information about ASHRAE, go to: <https://www.ashrae.org>.

## How the Dehumidistat Works

When using either the Two-Speed Switch with Humidity Sensor (435245) or the PrecisionSYNC Control (435244) a built-in dehumidistat is present. The following information is provided on how it works.

High indoor humidity levels, during the heating season, have become a problem in many well insulated, tight homes. Excessive condensation on the windows is a visual sign of high indoor humidity levels. High indoor humidity levels can result in mold, mildew and the eventual degradation of the building structure itself. Your ERV reduces indoor humidity levels when the outdoor air is drier than the indoor air.

These conditions usually occur during the heating season when outdoor temperatures are less than 59°F (15°C).

During the heating season, the operation of the ERV may reduce indoor humidity levels sufficiently to eliminate the need for further dehumidification. Use the adjustable dehumidistat feature located on the control if your home requires further dehumidification during the heating season.

The humidification function aggressively addresses high indoor humidity levels by initiating high speed ventilation when the indoor humidity levels rise above the set point on the control. Once the humidity in the house is reduced, the ERV will revert back to its previous setting.

It is recommended to operate the ERV for the first few days without use of the dehumidistat function to observe if a further dehumidification effect will be required.

The dehumidistat operates in percentage of RH (relative humidity) with 60 being high and 20 being low. If after a few days, further dehumidification is required (the building is still too humid), set the humidity level to a lower amount.

The average person is comfortable between 30% and 50% RH. The dehumidistat should be set to OFF for all seasons except the heating season since a dehumidifying effect only occurs when the outdoor air is dryer than the indoor air.

### **Dehumidification Sensing**

Every 6 hours the ERV will run and sample the outdoor air temperature (this includes when the unit is in Standby mode) to read the outdoor temperature. The unit then resumes operations at the selected mode and speed (approximately 60 second duration). Dehumidistat Disable or Dehumidistat Re-enable may be initiated.

Dehumidistat Disable automatically disables the Dehumidistat function on the main wall control when outdoor temperatures exceed 15°C (59°F) for a full 24-hour period. All other ERV features, and functions operate normally while the Dehumidistat function is disabled.

Dehumidistat Re-enable automatically re-enables the Dehumidistat function if either the outdoor temperature drops below 15°C (59°F) for a full 24-hour period or if the ERV is reset (unplugged for 30 seconds).

## Two-Speed Switch with Intermittent Mode (435246)

The control offers the following features to control your home's ventilation:

- Two-speed fan setting (LOW / HIGH).
- Standby setting (fan OFF).
- 20min on / 40min off mode (fan defrost models).
- 20min on / 40min recirculation mode (damper defrost models).
- Compatible with Wireless Timers. Connect to 3 wire 20 gauge low voltage wire.
- Slim-line design.

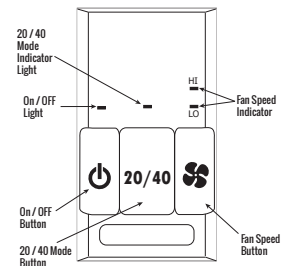




Figure 4. Two-Speed Switch with Intermittent Mode

**Table 6. Two-Speed Switch with Intermittent Mode Settings**

Settings	Icon	Description
Turning on the Control		Press and release the ON/OFF button. The light above will illuminate.
Setting the Ventilation Speed		Press and release the Fan button to select LOW or HIGH fan speed. The corresponding "Indicator Light" will illuminate. If both LO and Hi indicator lights are off, the fan is OFF but will turn ON if required by the Dehumidistat or remote Timer (if installed).
20/40 Mode	<b>20 / 40</b>	Press and release the 20/40 button. The light above will illuminate. The unit will run 20 min on / 40 min off mode in fan defrost models and 20 min on / 40 min recirculation mode on recirculation damper defrost models.

## Two-Speed Switch with Humidity Sensor (435245)

The control offers the following features to control your home's ventilation:

- Two-speed fan setting (LOW / HIGH).
- Standby setting (fan OFF).
- Electronic dehumidistat.
- Compatible with wireless timers. Connect to 3-wire 20 gauge low voltage wire.
- Designed to be mounted in a standard 2 x 4" (51 x 102 mm) electrical box or surface mounted to a wall.

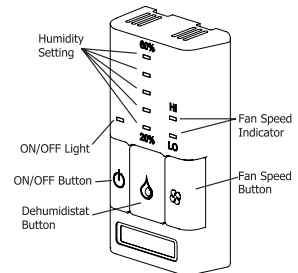





Figure 5. Two-Speed Switch with Humidity Sensor

**Table 7. Two-Speed Switch with Humidity Sensor Settings**

Settings	Icon	Description
Turning on the Control		Press and release the ON/OFF button. The light above will illuminate.
Setting the Ventilation Speed		Press and release the Fan button to select LOW or HIGH fan speed. The corresponding "Indicator Light" will illuminate. If both LO and Hi indicator lights are off, the fan is OFF but will turn ON if required by the Dehumidistat or remote Timer (if installed).
Humidity Control		Your unit will reduce indoor humidity when outdoor humidity levels are lower than indoor humidity levels. This feature is only effective when the outdoor temperature is below 59°F (15°C).
Setting the Dehumidistat		Press and release the Dehumidistat button until the Dehumidistat Light is at the desired setting. After a few seconds the Dehumidistat light will either flash or be on continuous. A flashing light indicates the humidity level is higher than the setting and the unit is operating on high speed ventilation. A continuous light indicates the humidity level is lower than the setting. The Dehumidistat will override the current speed setting to HIGH speed. The Dehumidistat function can be turned OFF by pressing the button until no Dehumidistat light is on. Refer to the "How the Dehumidistat Works" on page 10 of this instruction for a detailed description of Dehumidistat functionality.

### **IMPORTANT**

Only one control can be installed on the system.

Timers will not function when mode of operation is set to "OFF", unless specifically installed for that function. Refer to "Installing Standby Jumper" on page 25.

# PrecisionSYNC Control (435244)

The control offers the most advanced features to control your home's ventilation:

- Five-speed fan setting.
- Standby setting (fan speed 0).
- Electronic dehumidistat.
- 20/40/60 HIGH speed override button.
- Compatible with Wireless Timer.
- Easy to read back-lit LCD screen.
- Slim-line design.
- Connect to 3-wire 20 gauge low voltage wire.

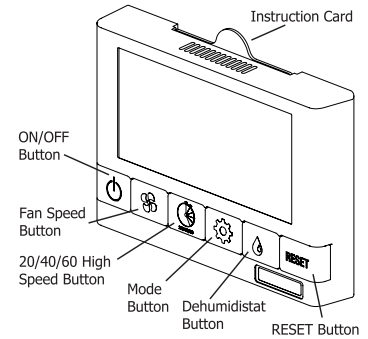


Figure 6. PrecisionSYNC Control

Function	Icon
Continuous Ventilation	
20 Minutes On, 40 Minutes Recirculation	
20 Minutes On, 40 Minutes OFF	
10 Minutes On, 50 Minutes OFF	
Continuous Recirculation	

Mode	Icon	Description
Turning on the Control		Press and release the ON/OFF button. The light above will illuminate.
Setting the Ventilation Speed		Press and release the Fan button to select LOW or HIGH fan speed. The corresponding "Indicator Light" will illuminate. If both LO and Hi indicator lights are off, the fan is OFF but will turn ON if required by the Dehumidistat or remote Timer (if installed).
20/40/60 High Speed Button		Press and release the 20/40/60 High Speed button to temporarily initiate HIGH Fan speed for 20, 40 or 60 minutes. Press once for 20 minutes, twice for 40 minutes, three times for 60 minutes and four times to disable. The timer symbol will appear on the screen and the corresponding section of the clock will flash to indicate the time interval selected. When the timer runs out, the unit will return to its previous operating speed.
Setting the Mode of Operation		There are five modes of operation available with the PrecisionSYNC Control (435244). Pressing the Mode button will display the different modes of operation on the screen. Fan defrost models do not have recirculation modes available.
Setting the Dehumidistat		The PrecisionSYNC Control displays the current indoor humidity in LARGE numbers and the Dehumidistat setting in SMALL numbers on the screen. If the indoor humidity is above the set point, the control will initiate HIGH Fan speed operation in Ventilation mode until the indoor humidity has been reduced below the set point. Press and release the Dehumidistat button to adjust the Dehumidistat setting. The Dehumidistat can be set between 25% RH and 60% RH. To disable the Dehumidistat function on the control, cycle through the setting until OFF is displayed. Refer to "How the Dehumidistat Works" on page 10 in this instruction for a detailed description of the Dehumidistat function.
Reset Button	RESET	The RESET button will clear the current Fan, Timer, Mode and Dehumidistat settings and set the unit into LOW fan speed, Ventilation mode and a Dehumidistat setting of 40%.
Service Indicator		A service indicator appears when the unit requires routine maintenance. Press and hold the ON/OFF button for 5 seconds to reset the service indicator once maintenance has been performed.

## 20/40/60 Minute Timer (435247)

Timers are available as wired or wireless. The timer will override the operational mode of the control (regardless of the setting) and initiate HIGH fan speed Ventilation for 20, 40 or 60 minutes. The ERV will return to the selected operational mode and fan speed setting upon completion of the timer cycle.

### Using Timers

Press the button to initiate high speed ventilation for 20, 40 or 60 minutes. The corresponding status light will illuminate to indicate either 20, 40 or 60 minutes of high speed fan operation. Press the button until the status lights are no longer illuminated to cancel high speed timer operation.

### Optional Lockout Mode

The Wired Timer has a lockout mode feature that can be set to disable the timer. Set the lockout mode by holding the button for five seconds. Disable lock-out mode by holding the button for 5 seconds. Connect to 3-wire, 20-gauge (min.) low-voltage wire and install in a standard 2 x 4" (51 x 102 mm) electrical box.

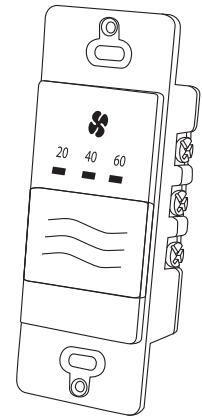


Figure 7. 20/40/60 Minute Timer

## 20/40/60 Minute Wireless Timer (435248)

The Wireless Timer pairs wirelessly to the control. Wireless Timers have an estimated range of 40 feet (12 meters) with no obstructions. To increase the range of the timer, a Wireless Repeater may be used. Multiple timers can be paired to a single control. They are designed to be mounted in a standard 2 x 4" (51 x 102 mm) electrical box or surface mounted to a wall.

### Replacing The Battery

The red LED battery indicator will illuminate when the battery on the timer needs to be replaced. Replace the battery by:

- Pulling the face plate off the wall.
- Replacing the battery located on the back of the Timer Face Plate.
- Re-attaching the face plate to the back plate. Be careful not to damage the tabs on the back plate when reattaching the face plate.

\* Refer to "Installation and Operation of 20/40/60 Minute Timer (435248)" on page 21 for pairing instructions.

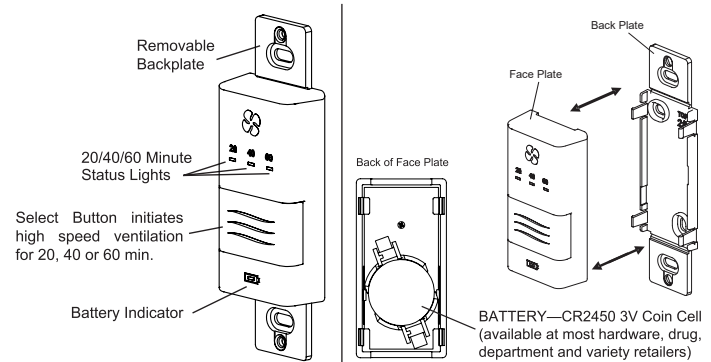


Figure 8. 20/40/60 Minute Wireless Timer

## Wireless Repeater (435249)

This device is used to extend the range of the Wireless Timer. The Wireless Repeater plugs directly into a 120 V power outlet.

The Wireless Repeater should be installed at the halfway point between the 20/40/60 Minute Wireless Timer and the control if the timer is out of range.

When the Wireless Repeater is positioned correctly, a solid green LED will illuminate indicating the Wireless Repeater has a strong connection to the main wall control and may be moved farther away if necessary.

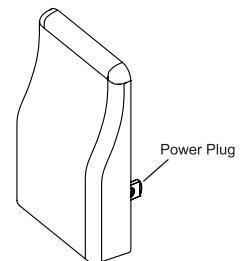


Figure 9. Wireless Repeater

\* Refer to "Installation and Operation of Wireless Repeater (435249)" on page 23.

## Overview of Installation Methods

There are three methods of installation for the ERV:

- Simplified installation - See “Installation Methods - Simplified (Return/Return)” on page 15.
- Partially dedicated installation - See “Installation Methods - Partially Dedicated” on page 16.
- Fully dedicated installation - See “Installation Methods - Fully Dedicated” on page 17.

## Connecting the Ductwork

The installer must ensure all ductwork is sized and installed as designed to ensure the system will perform as intended.

The amount of air that the ERV unit will deliver is directly related to the total external static pressure of the system. Static pressure is a measure of resistance imposed on the blower by the length of ductwork plus the number of fittings used in the ductwork.

A well designed and installed ducting system will allow the ERV to operate at its maximum efficiency.

All ducts should be kept as short as possible and have as few bends or elbows as possible to maximize airflow. 45° elbows are preferred to 90° elbows. Use Y-fittings instead of T-fittings whenever possible.

All duct joints must be fastened with screws, rivets or duct sealant and wrapped with mastic or quality duct tape to prevent leakage. Mastic is preferred but if duct tape is used it should be the aluminum foil type.

Use galvanized (rigid) ducting whenever possible although flexible duct can be used in moderation, if necessary.

A short length (approximately 12 inches [300 mm]) of non-metallic flexible duct should be connected between the ERV and the supply/exhaust duct system to avoid possible noise transfer through the duct system.

All ducts running through attics and unheated spaces must be sealed and insulated to code.



### **IMPORTANT**

Applications such as greenhouses, atriums, swimming pools, saunas, etc. have unique ventilation requirements which should be addressed with an isolated ventilation system.

## Installation Methods - Simplified (Return/Return)

The simplified method draws stale air from the cold air return duct of the air handler/furnace and introduces an equal amount of fresh air farther downstream into the cold air return as illustrated in the following figures.

### Installation Notes:

- See unit specifications for exact port locations.
- Unit is normally balanced on HIGH speed with the furnace blower ON.
- Ensure as much distance as possible between the supply and exhaust connections to the cold air return of the furnace.
- The exhaust air connection should be upstream of the supply air connection to prevent exhausting any fresh air.
- Weatherhood arrangement is for drawing purposes only. The weatherhoods are to be installed in accordance with local building codes or manufacturer recommendations.
- The airflow can be confirmed on site using the balancing procedures found in this manual.
- Interlocking the air handler blower with the ERV allows for distribution of fresh air throughout the space. While not required for proper function of the ERV, local codes or authorities having jurisdiction may require interlocking the ERV with the air handler blower.

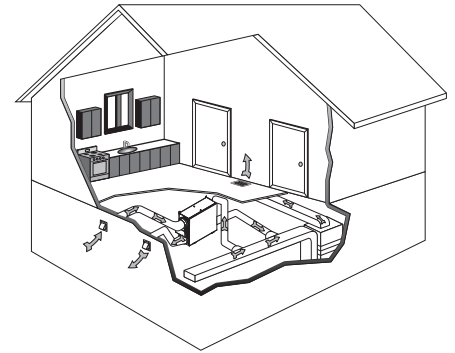


Figure 10. Simplified Installation (Return/Return)

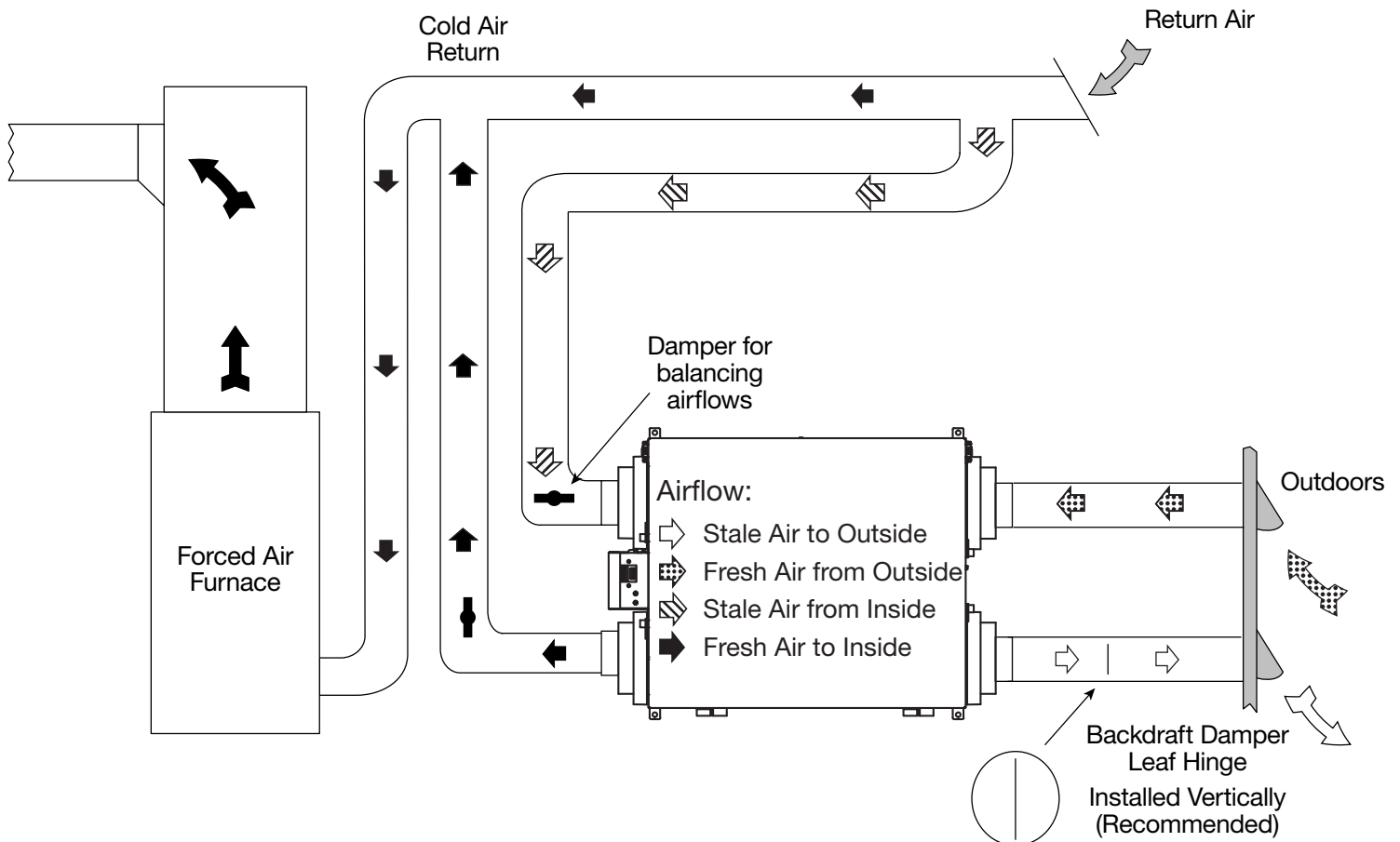


Figure 11. Simplified Installation (Return/Return)

## Installation Methods - Partially Dedicated

The partially dedicated installation draws stale air from specific points in the house and introduces an equal amount of fresh air into the cold air return as illustrated in the following building figures.

### Installation Notes

- See unit specifications for exact port locations.
- Unit is normally balanced on HIGH speed with the furnace blower ON.
- A minimum separation of 40" (one meter) is recommended between the two direct connections.
- The exhaust air connection should be upstream of the supply air connection to prevent exhausting any fresh air.
- Weatherhoods are to be installed in accordance with local building codes or manufacturer recommendations.
- The airflow must be confirmed on site using the balancing procedures found in this manual.
- Interlocking the air handler blower with the ERV allows for distribution of fresh air throughout the space. While not required for proper function of the ERV, local codes or authorities having jurisdiction may require interlocking the ERV with the air handler blower.

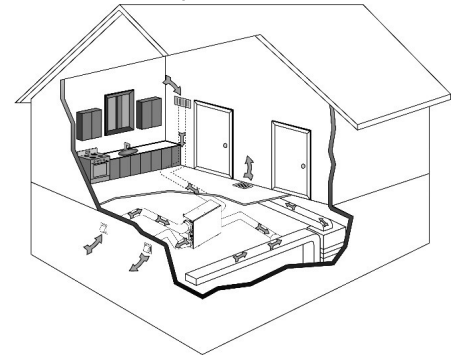


Figure 12. Partially Dedicated System

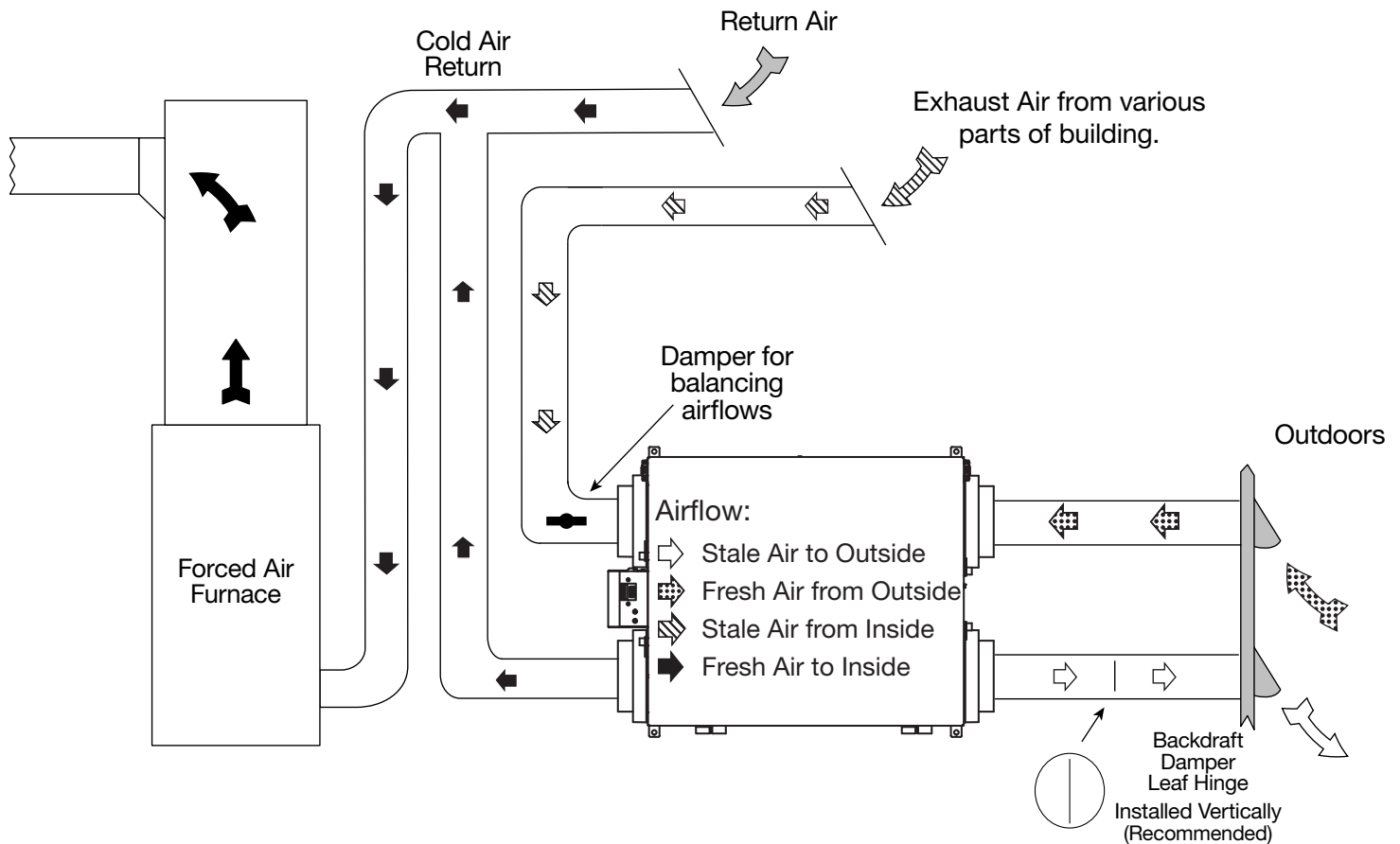


Figure 13. Direct Connection of Supply Air Stream to the Furnace Cold Air Return (Stale air drawn from key areas of home)



## Installation Methods - Fully Dedicated

The fully dedicated installation draws stale air from specific points in the building and delivers fresh air to specific locations of the building. This system is not connected to an air handler/furnace (see the following figures).

### Installation Notes

- See unit specifications for exact port locations.
- Unit is normally balanced on HIGH speed with the furnace blower ON.
- Weatherhoods are to be installed in accordance with local building codes or manufacturer recommendations.
- The airflow must be confirmed on site using the balancing in this instruction.

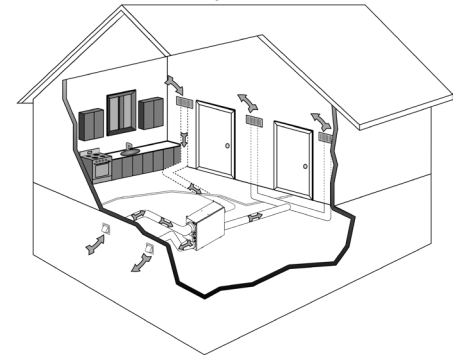


Figure 14. Fully Dedicated System

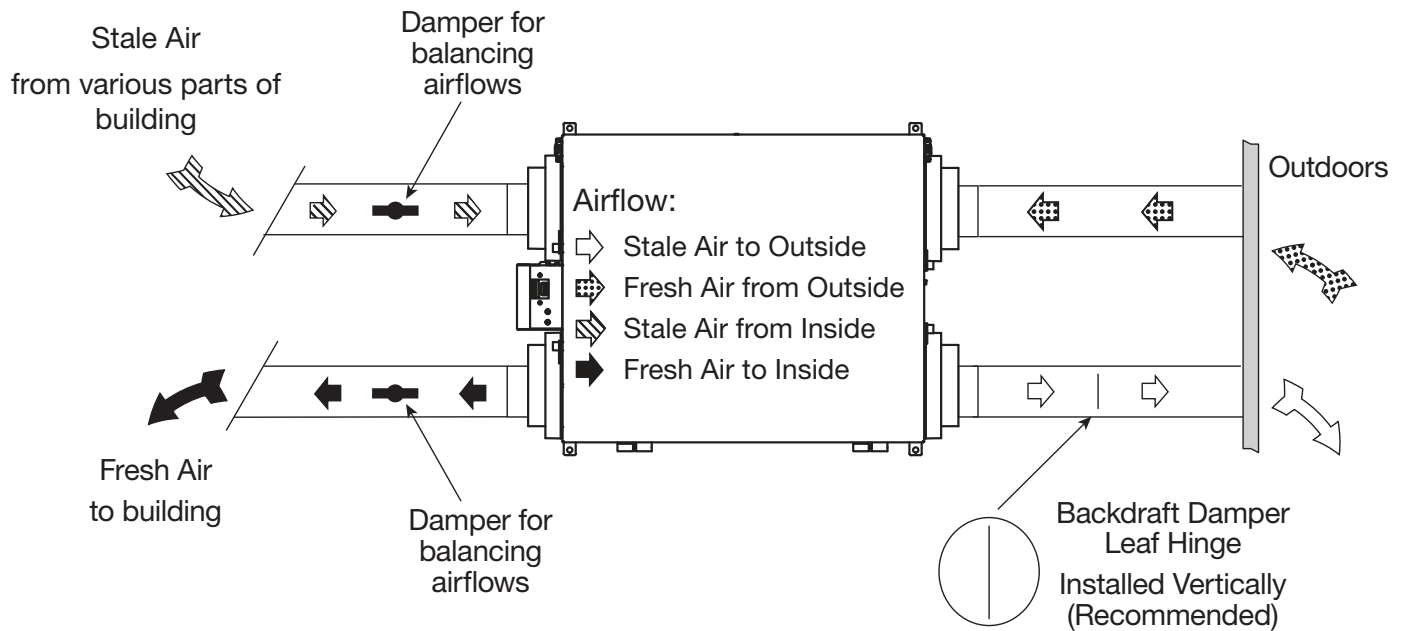


Figure 15. Fully Dedicated System (Not connected to forced air system)

## Unit Installation Location

It is recommended that the ERV unit be located in a conditioned space where it will be possible to conveniently service the unit:

- Complexity of work to install.
- Freezing conditions in the attic.
- Difficulty of access for service and cleaning.

Sufficient clearance in front/below (depending on model) of the access door is required for servicing the air filters and core. Clearance must be enough to allow removal of core from the unit.

### CAUTION

If possible, avoid installing units above areas or equipment that are sensitive to water damage. Otherwise, the use of an auxiliary drain pan under the installation is recommended.

Risk of carbon monoxide poisoning and/or explosion.  
Can cause injury or death.

Combustion and flue gases from heating appliances must never be allowed to enter living spaces.

ERV unit must be properly balanced (see page 29 - 31) to prevent negative pressure in structure. Negative pressure can cause back-drafting of combustion gases in other household appliances such as gas furnaces, oil furnaces, hot water heaters, wood stoves, fireplaces, etc.

## Unit Installation Restrictions

The following appliances should not be connected to the ERV unit:

- Clothes dryer.
- Stove top fan.
- Central vacuum system.

NOTE: Failure to follow this instruction will void the ERV unit warranty.

## Mounting the Unit

1. Using the hardware provided, install the mounting brackets on the unit. It is important to isolate the mounting brackets from the mounting surface to minimize vibration.
2. Install the unit to the mounting surface, using the mounting brackets provided.

Note: The ASSURE120 models can only be ceiling mounted.

The ASSURE140 models can be either ceiling mounted or wall mounted.

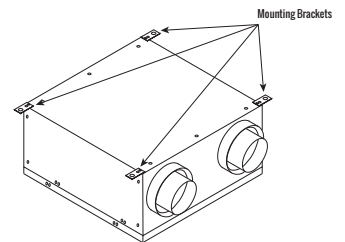
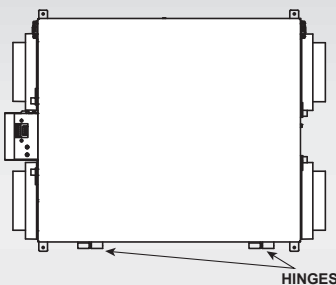
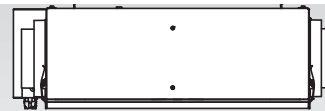


Figure 16. Mounting Brackets



**Wall Mounted**  
Must have hinges downward  
towards the floor  
(ASSURE140 ONLY)



**Ceiling Mounted**

Figure 17. Ceiling Mounting vs. Wall Mounting

### IMPORTANT

Do not drill additional holes in the ERV

Due to natural condensate accumulation, the unit must have the door hinges directed towards the floor in wall mount configuration.

## ERV Dual Intake and Exhaust Hood Kit

The ERV Dual Intake and Exhaust Hood Kit offers the benefit of requiring only one 6" (152 mm) hole in the exterior wall (as opposed to two separate weatherhoods) to complete the connections for fresh air intake and stale air exhaust. The pressure drop/airflow charts should be referred to when matching the Dual Intake and Exhaust Hood to the ERV. The Dual Intake and Exhaust Hood Kit is compatible with 5" or 6" diameter duct.

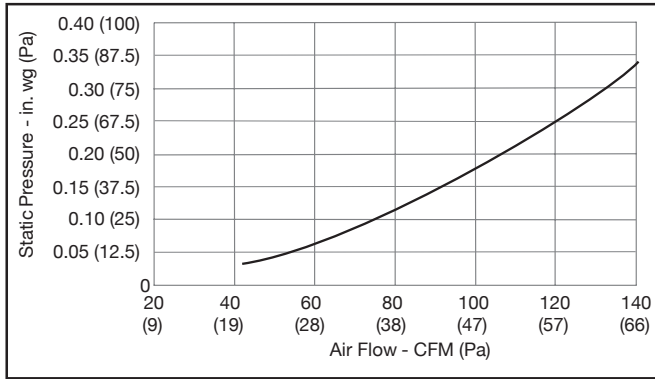


Figure 18. Intake Airflow Chart

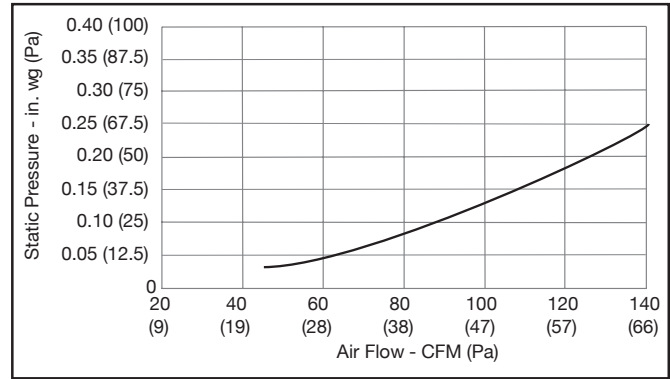


Figure 19. Exhaust Airflow Chart

### ⚠ CAUTION

Follow installation instructions located in Dual Intake and Exhaust Hood kit. Contact your local building authority before installation of the Dual Intake and Exhaust Hood kit to verify compliance with local building codes.

## Electrical Connections

Plug the ERV directly into a standard designated 120 VAC electrical outlet. Use of an extension cord is NOT RECOMMENDED for this appliance.

If further wiring is required, then a licensed electrician should make all electrical connections. See wiring diagrams for the units described in section titled "Service Information - Internal Wiring" on pages 28 - 29.

### ⚠ IMPORTANT

Electric Shock Hazard  
Can cause injury or death.

Confirm the polarity of the 120VAC supply source at the receptacle for the ERV device. The door safety switch of the ERV can cause an electrical shock hazard if the polarity is not properly wired. The grounding means of the ERV device should also be confirmed. The proper polarity and ground can be checked at the receptacle using a 3-prong plug device called a 'polarity tester'. Another method to check for proper polarity is to use a volt-ohm meter to check for voltage from line voltage to ground (chassis) at the ERV.

## Hardwiring the Unit

The ASSURE120 and ASSURE140 models can be hardwired. Connect line (black), neutral (white) and ground to the ground screw as shown in the figures below.

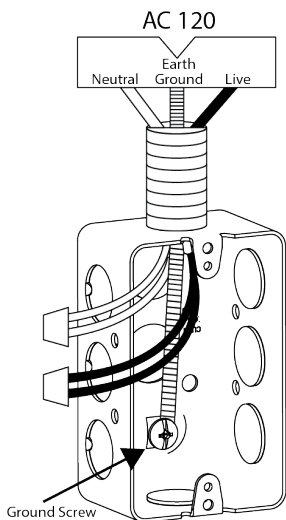


Figure 20. ASSURE120  
Hard Wire Method

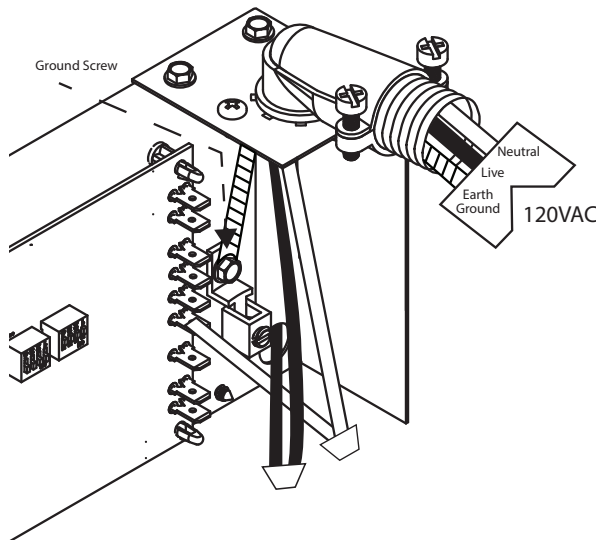


Figure 21. ASSURE140  
Hard Wire Method

### ⚠ CAUTION

Installation work and electrical wiring must be performed by qualified person (s) in accordance with all applicable codes and standards, including fire-rated construction. Contact your local building authority before installation.

### ⚠ IMPORTANT

Use the knock out hole that will best fit the installation. Ensure that the door of the unit can still be accessed and opened for future maintenance.

# Terminal Block

Each unit has a Terminal Block, The Terminal Block will either be Type A or Type B, shown below.

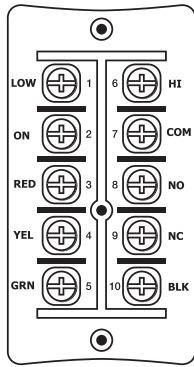


Figure 22. Terminal Block Type A

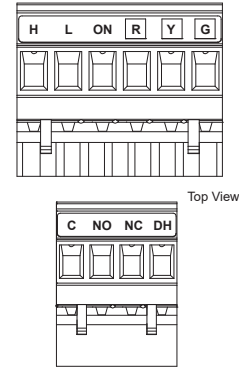


Figure 23. Terminal Block Type B

## Installation of Controls

The Two-Speed Controls may either be installed onto a flush mounted electrical switch box or surface mounted onto the wall. The optional PrecisionSYNC Control (435244) is to be surface mounted onto a wall. Only one control can be installed with a ventilation system.

1. For the PrecisionSYNC Control (435244), remove the operating instructions card from the top of the control (Figure 25, Box A).
  2. Separate the face plate from the back plate by firmly pulling apart (Figure 25, Boxes B or C). Be careful not to damage face plate contact pins.
  3. For the PrecisionSYNC Control, place the back plate of the control in the desired location on the wall and pencil mark the wall with the right and left screw holes (Figure 24, Box D).
  4. For the Two-Speed Switch with Humidity Sensor (435245) and Two-Speed Switch with Intermittent Mode (435246), place the back plate of the control in the desired location on the wall and pencil mark the top and bottom screw holes (Figure 24, Boxes E or F). For mounting the control without a decorative plate, break off top and bottom tabs and refer to Figure 24, Box F for mounting.
  5. Remove the back plate from the wall and mark the center hole for the wires in the middle of the screw holes. Refer to Figure 24, Boxes D, E or F for dimensions.
  6. Drill (two) 1/8" (3 mm) holes for the screws and wall anchors (Figure 24, Boxes D, E or F). For the PrecisionSYNC Control, drill a one inch hole in the center (Figure 24, Box D). For the Two-Speed Switch with Humidity Sensor (435245) and Two-Speed Switch with Intermittent Mode (435246), cut in a 3/4" (19 mm) by 1" (25 mm) oval hole in the center (Figure 24, Boxes E or F).
  7. Pull 3-wire 20 gauge (minimum) 100 feet (30-1/2 meters) length (maximum), through the opening in the wall.
  8. Connect red, green, and yellow to the wiring terminals located on the back plate (Figure 24, Boxes D, E or F).
  9. Attach the back plate to the wall using two supplied screws and anchors.
  10. Attach the face plate to the back plate (Figure 24, Boxes B or C).
- NOTE: Be careful to correctly align the face plate to avoid damaging the face plate contact pins.
11. For the PrecisionSYNC Control (435244), insert the instructions card into the control (Figure 24, Box A).
  12. Connect the 3-wire 20 gauge (minimum) 100 feet (30-1/2 meters) length (maximum) to the terminal block located on ventilator (Red, Yellow, and Green).
  13. On the terminal block connect a jumper wire between ON and RED. Refer to "Installing Standby Jumper" on page 25.

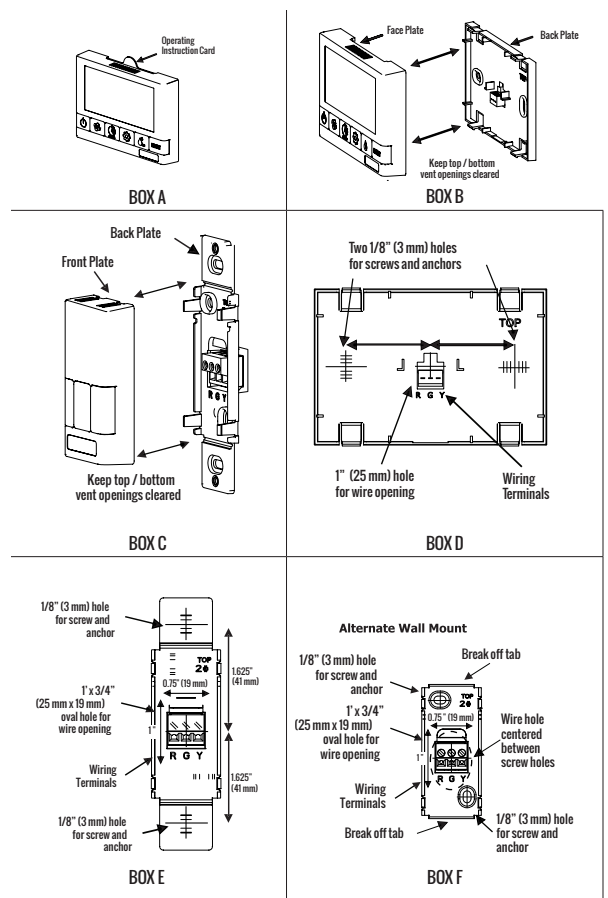


Figure 24. Installation of Controls

### IMPORTANT

Pay special attention not to damage the contact pins when removing and detaching the face plate.







# Installation and Operation of 20/40/60 Minute Wireless Timer (435248)

NOTE: Wireless timers can only be used with wall mounted Two-Speed Switch or PrecisionSYNC Control (435244).

The wireless timers may be installed onto a flush mounted electrical switch box or it may be surface mounted onto a wall. Multiple wireless timers (maximum six timers) may be installed with ventilation system.

To increase the range of a wireless timer, a Wireless Repeater should be used.

## Pairing


1. Turn on the main wall control by pressing the ON/OFF button  and remove the battery from 20/40/60 Minute Wireless Timer.
2. Pairing PrecisionSYNC Control (435244): Press the left and right buttons simultaneously on the control  and RESET buttons. The screen will go blank and the wireless symbol  appear flashing on the bottom right of the display. This indicates that the control is now in pairing mode (Figure 25, Box D).
3. Pairing 20/40/60 Minute Wireless Timer (435248) with Two-Speed Switch with Humidity Sensor (435245) and Two-Speed Switch with Intermittent Mode (435246): Press the left and right buttons simultaneously on the control  and  buttons). The bottom row of three LEDs will begin flashing. This indicates that the main control is now in pairing mode (Figure 26, Box E).
4. Keep the timer within 16" (406 mm) of the control when pairing.
5. Install the battery in the 20/40/60 Minute Wireless Timer. All four lights on the timer will immediately flash five times, then only the red battery light will remain on for approximately 12 seconds after which the 40 light flashes. 20, 40, 60 lights will flash until paired or will stop if not paired within 12 seconds. If pairing was not successful you now must return to step 1 to restart the pairing process.
6. Press the  button on the control to exit pairing mode when wireless timers have been successfully paired.

To pair additional wireless timers with the same wall control, or if pairing was not successful, repeat steps 1-6.

When paired, the wireless timers can be moved and installed elsewhere.

Estimated range of the wireless timer is 40' with no obstructions. A Wireless Repeater may be installed to increase the range of the 20/40/60 Minute Wireless Timer.

For Two-Speed Switch with Humidity Sensor (435245) and Two-Speed Switch with Intermittent Mode (435246): To test if the pairing was successful, ensure the unit is in low speed then press the button on the 20/40/60 Minute Wireless Timer and listen for the ERV to initiate HIGH fan speed ventilation.

For PrecisionSYNC Control (435244): To test if the pairing was successful press the button on the 20/40/60 Minute Wireless Timer and look for the Timer  icon to display on the LED screen next to the fan speed.

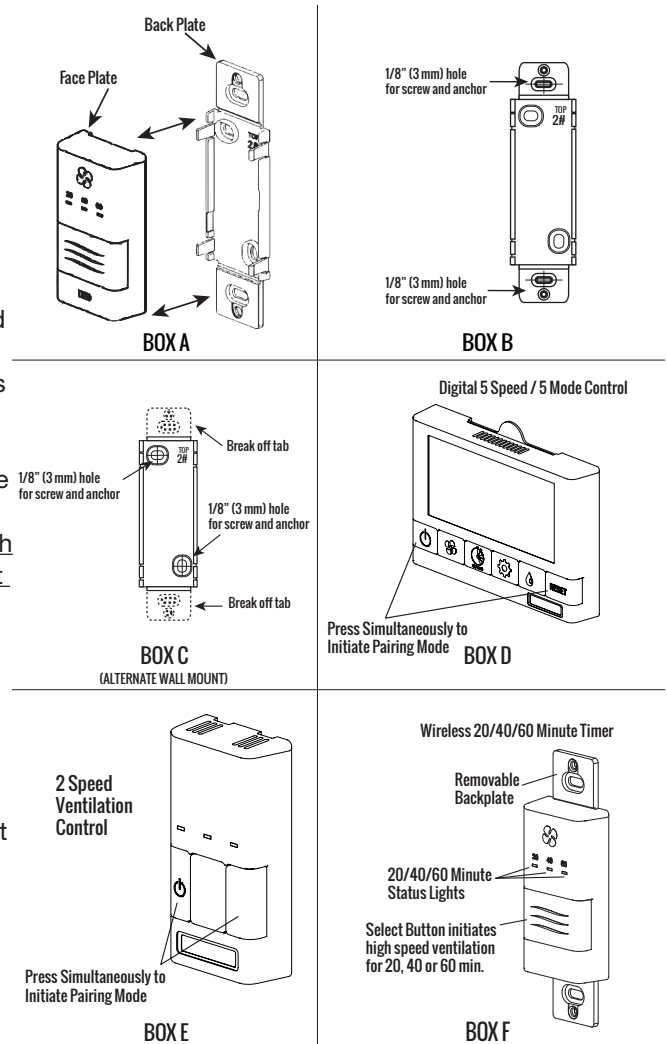


Figure 25. Installation of Timer

# Installation and Operation of 20/40/60 Minute Wireless Timer (435248) (cont'd.)

## Unpairing

1. Remove the battery from the back of the 20/40/60 Minute Wireless Timer.
2. Press and hold the button on the front of the 20/40/60 Minute Wireless Timer.
3. While holding the button, reinsert the battery in the 20/40/60 Minute Wireless Timer. Continue holding the button until the LED under 40 begins flashing. The 20/40/60 Minute Wireless Timer will now be unpaired with the control.

Note: Use this procedure when the pairing procedure is not working to factory-reset the time delay.

## Installation

1. Separate the face plate from the back plate by firmly pulling apart (Figure 26, Box A).
2. For mounting the control without a decorative plate, break off top and bottom tabs and refer to Figure 26, Box C for mounting.
3. Place the back plate of the control in the desired location on the wall and pencil mark the top and bottom screw holes (Figure 26, Boxes B or C). Drill two 1/8" (3 mm) holes.
4. Attach the back plate to the wall using the two supplied screws and anchors.
5. Attach the face plate to the back plate (Figure 26, Box F).








## IMPORTANT

The wireless timers and Wireless Repeater (435249) must be paired to the wall control of the ERV. Multiple Timers and Wireless Repeater (435249) can be paired to a single wall control.

## Installation and Pairing of Wireless Repeater (435249)

A Wireless Repeater (435249) may be necessary if the distance of the 20/40/60 Minute Wireless Timer (435248) is too great to communicate directly with the control. The Wireless Repeater (435249) is plugged directly into a 120V power outlet.

1. Turn on the main wall control by pressing the ON/OFF button .
2. Pairing Wireless Repeater (435249) with PrecisionSYNC Control (435244): Press the left and right buttons simultaneously on the main wall control  and RESET buttons. The screen will go blank and the wireless  symbol will appear flashing on the bottom right of the display. This indicates that the control is now in pairing mode.
3. Pairing Wireless Repeater (435249) with Two-Speed Switch with Humidity Sensor (435245) and Two-Speed Switch with Intermittent Mode (435246): Press the left and right buttons simultaneously on the control  and . The bottom row of three LED's will begin flashing. This indicates that the control is now in pairing mode.
4. The Wireless Repeater (435249) must be powered within 16" (406 mm) of the control for pairing. If an outlet is not available an extension cord should be used to power the Wireless Repeater (435249) during pairing.
5. Plug the Wireless Repeater (435249) into the power outlet. The green light will flash after approximately 12 seconds indicating that the Wireless Repeater (435249) is paired with the control.
6. Press the  button on the control to exit pairing mode and the Wireless Repeater (435249) may now be unplugged and moved to its permanent location midway between 20/40/60 Minute Wireless Timer and Control.

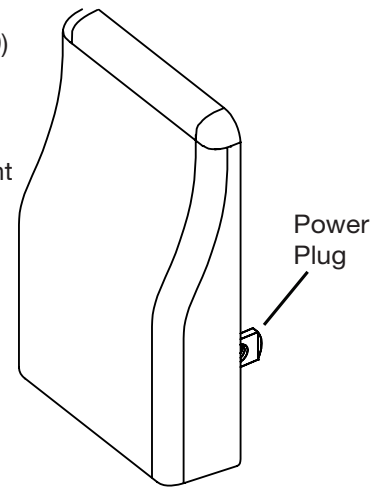


Figure 26. Wireless Repeater

To pair additional Wireless Repeater (435249) with the same control, repeat steps 1-5 until all Wireless Repeaters (435249) have been paired.

When installed in its permanent location, the green LED will indicate the quality of communication with the wall control. See Table 10 below.

Table 10. Wireless Range Extender LED Indication

LED Indication	Quality of Communication
Solid green	Best
Flashing green	Good
Solid Red	Bad

# Installation of 20/40/60 Minute Timer (435247)

## Installation Requirements

The following installation requirements must be followed:

- Timers mount in standard 2 x 4" (51 x 102 mm) electrical boxes.
- If multiple timers are used, individually wire each timer to the unit.
- Use 3-wire 20-gauge (min.) low-voltage wire.

## Lockout Mode

The timer can be set to lockout mode (timers disabled) as follows: press and hold the button for five seconds; the status lights will flash; then release the button. The timer is now in lockout mode.

If the button is pressed during lockout mode, the status lights will momentarily illuminate but no override will be initiated. If lockout mode is initiated when the timer is activated, the timer will continue its timed sequence but will not allow any further overrides to be initiated.

To unlock lockout mode, press and the button for five seconds; until the high-speed status lights stop flashing; then release the button. The timer will now operate normally.

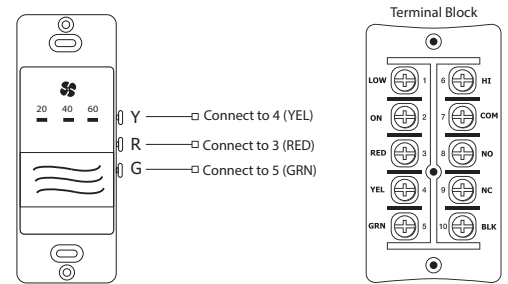


Figure 27. DET01 Timer with Type A terminal block

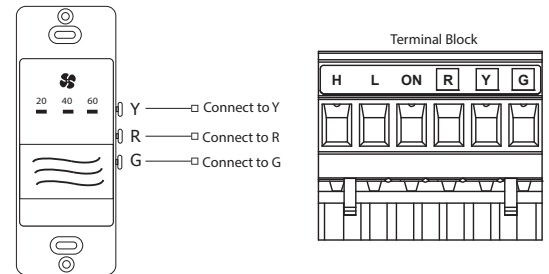


Figure 28. DET01 Timer with Type B terminal block

## Installation of Third Party Mechanical Timers

The ERV is compatible with two wire, "dry contact" third party mechanical timers. This may be useful for retrofit situations where only two wires are available for the timer.

Install the two wire timer by connecting a jumper wire between ON and RED. Connect the two timer wires to ON and HI.

NOTE: An alternative to using the 2-wire timers is to install the system with wireless timers.

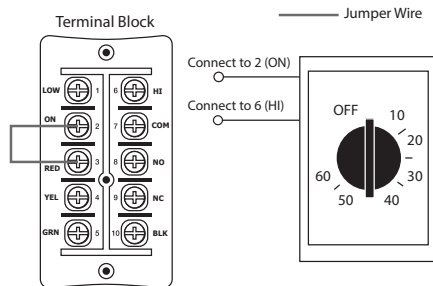


Figure 29. Dry Contacts Connections with Type A terminal block

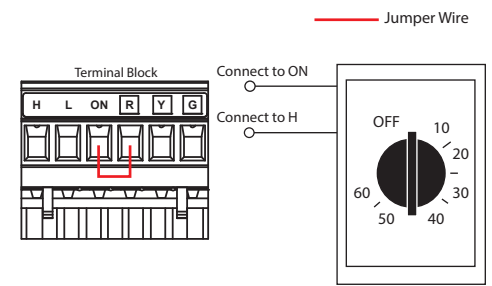


Figure 30. Dry Contacts Connections with Type B terminal block

## Interlocking ERV to Air Handler/Furnace Blower

Connecting the ERV unit as illustrated will ensure the air handler/furnace blower motor is operating whenever the ERV is ventilating.

In simplified (return/return) installation and partially dedicated installation allows for distribution of fresh air throughout the space. While not required for proper function of the ERV, local codes or authorities having jurisdiction may require interlocking the ERV with the air handler blower. See Figure 31 and Figure 32 for connection details.

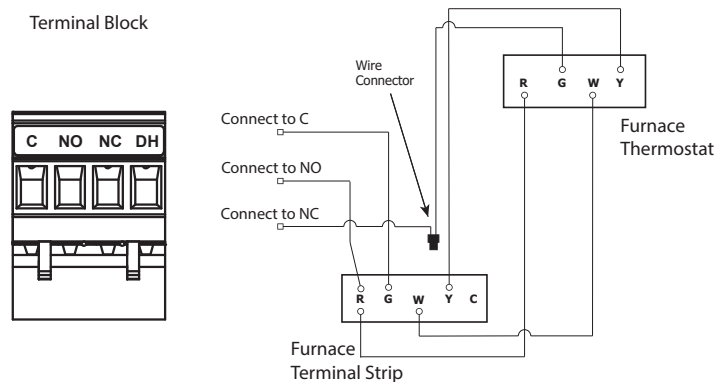


Figure 31. Air Handler/Furnace Blower Connections with Type B Terminal Block

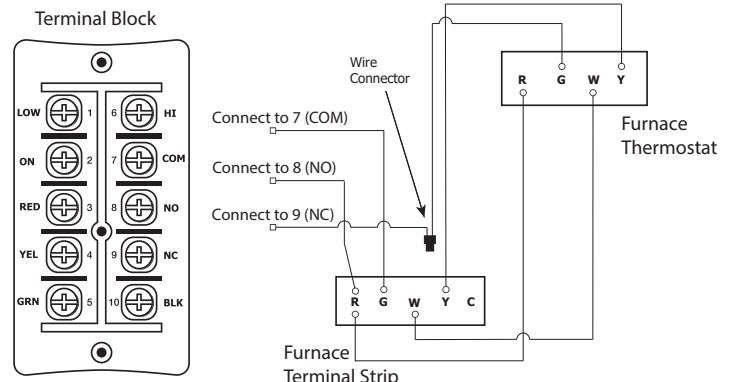


Figure 32. Air Handler/Furnace Blower Connections with Type A Terminal Block

# Installing “Standby” Jumper & Activating Dry Contact Controls

## Installing “Standby” Jumper

A jumper must be installed between the ON and R terminals to change the default OFF setting from “fully-OFF” to “standby-OFF”. Timers will continue to initiate high speed ventilation while unit is in “standby-OFF” with the exception of the DET02 Wireless Timer.

The ERV will be “fully-OFF” when OFF is selected on the main control and no jumper is installed between the ON and R terminals. Timers and/or controls will not function when the ERV is “fully-OFF”.

On the DXPL03 Deluxe Control “standby-OFF” can be achieved by setting the control to ON and selecting speed 0. Timers will initiate high speed ventilation when activated.

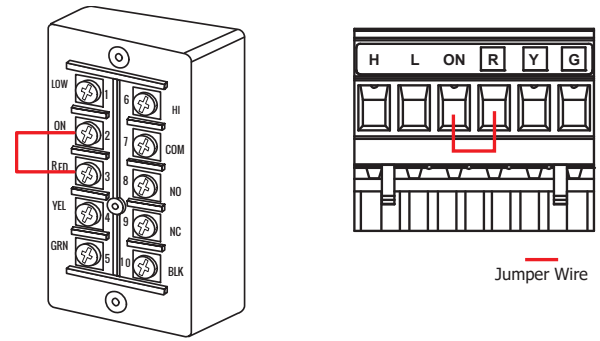


Figure 33. Standby Jumper Locations

## CAUTION

Building codes in some areas require fully-off functionality. Check with your local building authority before modifying the unit to standby-off. Unintentional operation of the ERV by the end user may occur if the unit is modified from fully-off to standby-off.

## Activating Dry Contact Controls

Dry contact connections can be used to connect any third party controls or simple wire jumpers can be used. Dry contacts will engage continuous low speed ventilation, continuous high speed ventilation, or dehumidification. See Table 11 below. The dehumidification dry contact will be disabled in accordance with the dehumidification disable function (see page 12).

The NO, NC and COM connections are a relay that switches when the fans are turned on or off. These connections can be used to control third party devices such as motorized dampers.

Note: contacts NO, NC and COM can only receive a 12 V signal.

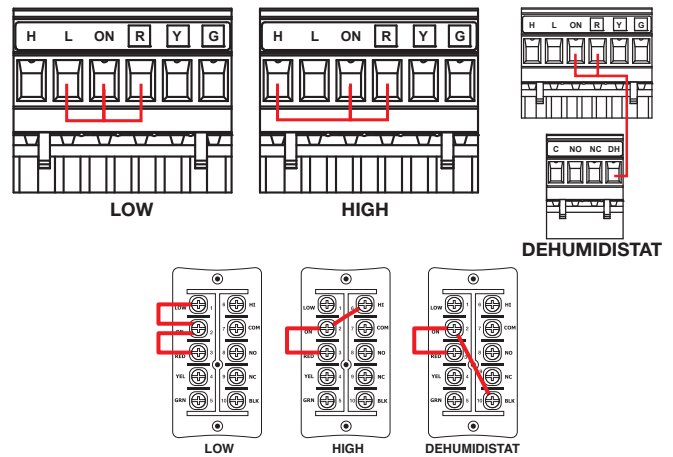


Figure 34. Dry Contact Locations

Table 11. Dry Contacts

Speed	Description
Low speed	A jumper between 2 (ON) and 1 (LOW) initiates low speed ventilation.
High speed	A jumper between 2 (ON) and 6 (HI) initiates high speed ventilation.
Dehumidistat	A dry contact for a dehumidistat is connected between 2 (ON) and 10 (DH).

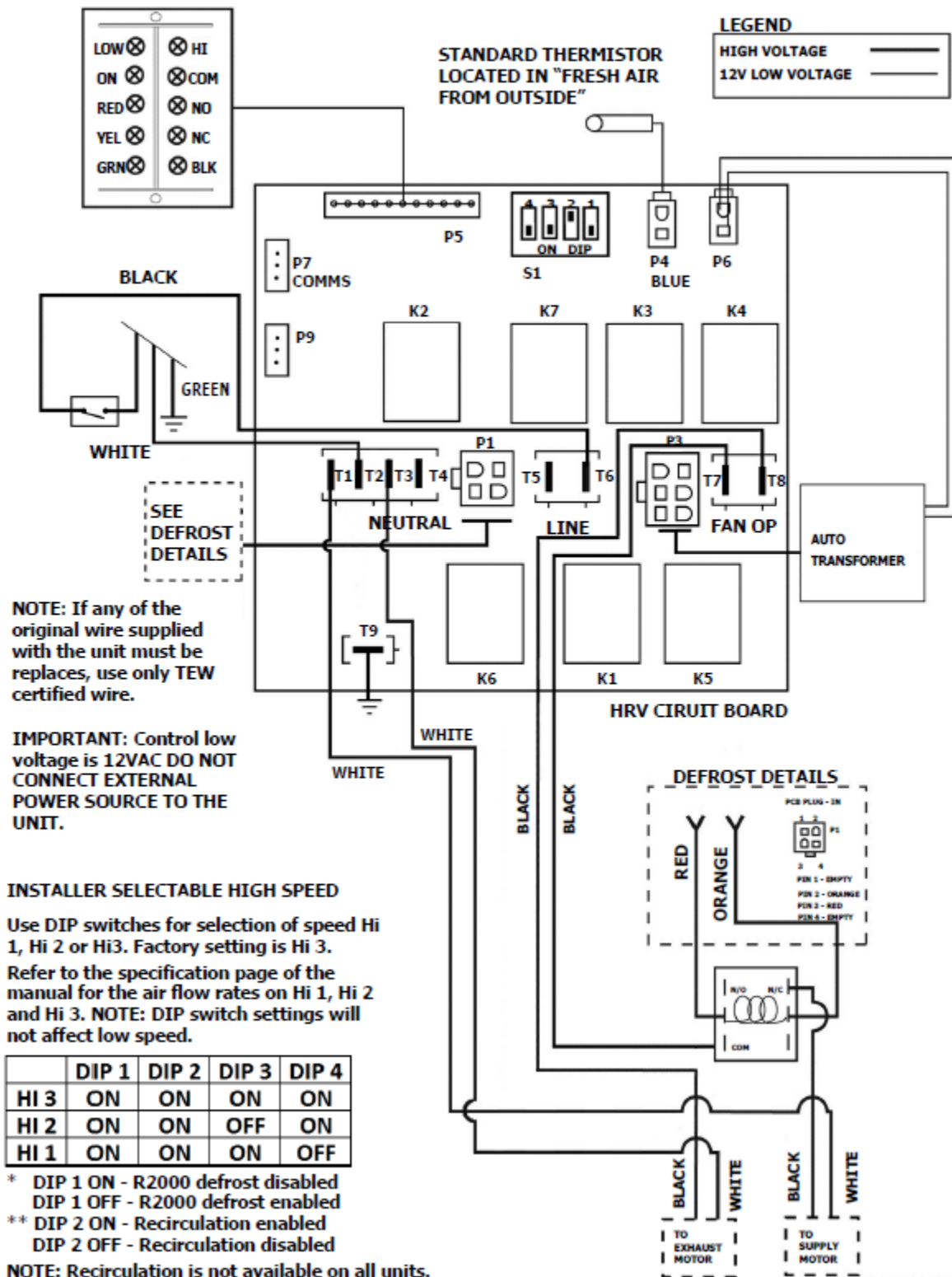
## IMPORTANT

The ERV must have a jumper in place between 2 (ON) and 3 (RED) on the Terminal Block when installing the unit without a Control.

Note: Terminal Block “Type A” displayed in figures, refer to “Terminal Blocks” on page 21.



## CAUTION: ELECTRICAL CONTROL PANEL, SERVICE BY ELECTRICIAN ONLY



**NOTE:** If any of the original wire supplied with the unit must be replaced, use only TEW certified wire.

**IMPORTANT:** Control low voltage is 12VAC DO NOT CONNECT EXTERNAL POWER SOURCE TO THE UNIT.

### INSTALLER SELECTABLE HIGH SPEED

Use DIP switches for selection of speed Hi 1, Hi 2 or Hi 3. Factory setting is Hi 3. Refer to the specification page of the manual for the air flow rates on Hi 1, Hi 2 and Hi 3. NOTE: DIP switch settings will not affect low speed.

## Unit Dip Switch Orientation

Installer selectable high speed settings

The circuit board on the units have adjustable DIP switches to select the maximum air flow at high speed. Adjusting high speed can be useful to accurately satisfy the calculated ventilation rate. The table below indicates how to adjust high speed to speed 4 (Hi 2) and speed 3 (Hi 1). Refer to the specification pages in the manual for the air flow rates for speeds 5, 4 and 3. The factory setting is speed 5 (Hi 3).

**Table 12. Dip Switch Orientation**

Speed	SWITCH 1			
	1	2*	3	4
Hi 3 (Speed 5)	ON	OFF*	ON	ON
Hi 2 (Speed 4)	ON	OFF*	OFF	ON
Hi 1 (Speed 3)	ON	OFF*	ON	OFF

\*Leave on Factory Setting

Dip 1 On - R2000 Defrost cycle disabled

Dip 1 Off - R2000 Defrost cycle enabled

Dip 2 On- Recirculation Enabled (damper defrost models only)

Dip 2 Off- Recirculation Disabled (fan defrost models only)

## Balancing the Airflows

Balancing the airflows is critical to ensure that the amount of air coming into the building equals the amount of air exhausted to the outside of the building. If these two airflows are not properly balanced, the following issues may occur:

- A positive or negative pressure in the house.
- ERV will not operate at its maximum efficiency.
- ERV will not defrost properly.

The ASSURE120 models are considered “factory balanced”. Due to the design of the unit, if the supply and exhaust static pressure of the duct installation are within 0.3 (in w.g.) of each other, the supply and exhaust airflows will be within 10% of each other. These units, therefore, do not require balancing during installation if these conditions are met. If these conditions are not met then follow the manual balancing procedure below.

The ASSURE140 models should be balanced using the Collar Port Method. See page 30.

## Manual Balancing

Airflow Measuring Gauge:

- A digital manometer is a suitable instrument for the balancing of airflows.

Gauge Attachments:

When sampling an airflow, various attachments are available for use on a digital manometer. The illustration below shows a digital manometer with a pitot tube attachment. This combination will measure the system air velocity pressure accurately, regardless of the duct size or shape (either round or rectangular).

Balancing Preparation:

Prior to performing the air balancing procedure, perform the following steps:

1. Seal the ductwork.
2. Confirm the installation and proper operation of all the components of the ERV.
3. Fully open the balancing dampers.
4. Turn off all household exhaust devices (range hood, clothes dryer, bathroom fans).
5. Set the system at high speed.
6. Prior to balancing the unit, first adjust airflows in the branch lines to specific areas of the house.
7. If the outdoor temperature is below 0°C (32°F), ensure the unit is not running in defrost.
8. If the system is a Simplified or Partially Dedicated installation, operate the furnace/air handler at high speed.

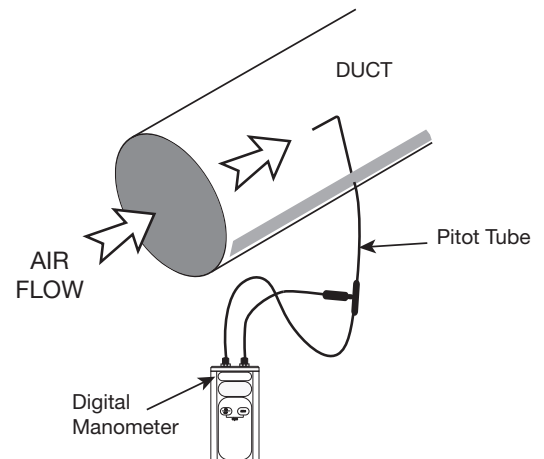
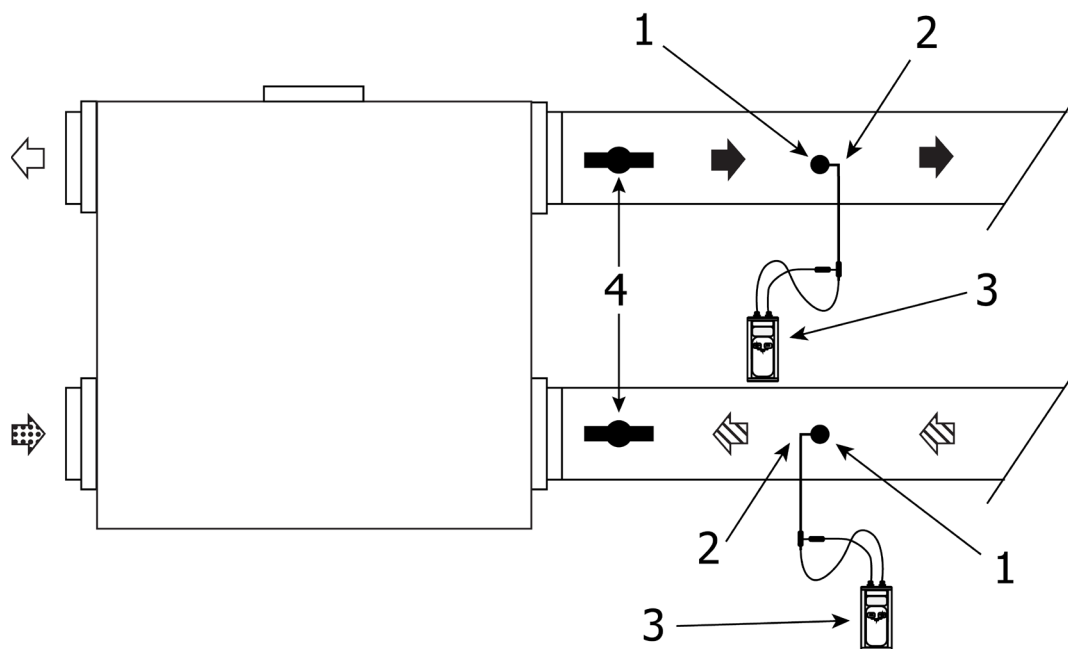


Figure 35. Manual Balancing

### **ATTENTION**

Continuous, excessive, positive pressure may drive moist indoor air into the external walls of the building. Once inside the external walls, moist air may condense (in cold weather) and degrade structural components or cause locks to freeze. Continuous, excessive, negative pressure may have several undesirable effects. In some geographic locations, soil gases such as methane and radon gas may be drawn into the home through basement or ground contact areas and may also cause the backdrafting of vented combustion equipment.

## Manual Balancing (continued)



### Airflow:

- Stale Air to Outside
- Fresh Air from Outside
- Stale Air from Inside
- Fresh Air to Inside

### Figure Callouts:

1. 3/16 in. Hole
2. Pitot Tube Tip
3. Digital Manometer
4. Balancing Damper

### Steps:

1. Drill a 3/16 in. hole in the duct, ideally 3 ft. downstream and 1 ft. upstream of any elbows or bends in the fresh air and stale air streams.
2. Insert the pitot tube with the tip facing into the air stream in the “Stale Air from Inside” stream. Move the pitot tube around in the duct (facing toward the airstream) and take an average reading. Record the reading.
3. Repeat Step 2 to measure the “Fresh Air to Inside” stream.
4. Review the readings and damper down the duct with the highest duct velocity pressure. Repeat Steps 2 and 3 until both ducts show identical readings. Upon completion of balancing, seal the holes with foil tape.

### Determining the CFM:

After balancing the airflows, calculate the CFM flow rate.

### Example

This example shows how to determine the airflow for a 6 in diameter duct. If the duct velocity pressure reads 0.025 in w.g. on the digital manometer, use the chart that came with the pitot tube to determine a duct velocity of 640 ft/min. for a duct velocity pressure of 0.025 in w.g.

### CFM Calculation

$$\begin{aligned}
 \text{CFM} &= \text{feet per minute} \times \text{cross section area of duct} \\
 &= 640 \times 0.196 \\
 &= 125
 \end{aligned}$$

*Cross section area of some common duct sizes:*

Cross-Section Area (ft <sup>2</sup> )	Duct Size (in.)
0.087	4 duct
0.139	5 duct
0.196	6 duct
0.267	7 duct



## ATTENTION

Installations where the ERV is ducted directly to the return of a furnace may require additional dampening on the fresh air to building duct. This is due to the high return static pressures found in some furnace installations.

## Balancing The Airflows – Collar Port Method - ASSURE140

Balancing ports are designed to be used in conjunction with a digital manometer to determine the stale and fresh airflows. Refer to “Collar Port Locations” to locate the ports for a particular model.

### Figure Callouts:

1. Measuring Device Digital Manometer
2. Protective Covers
3. Balancing Ports
4. 3/16” Tubing

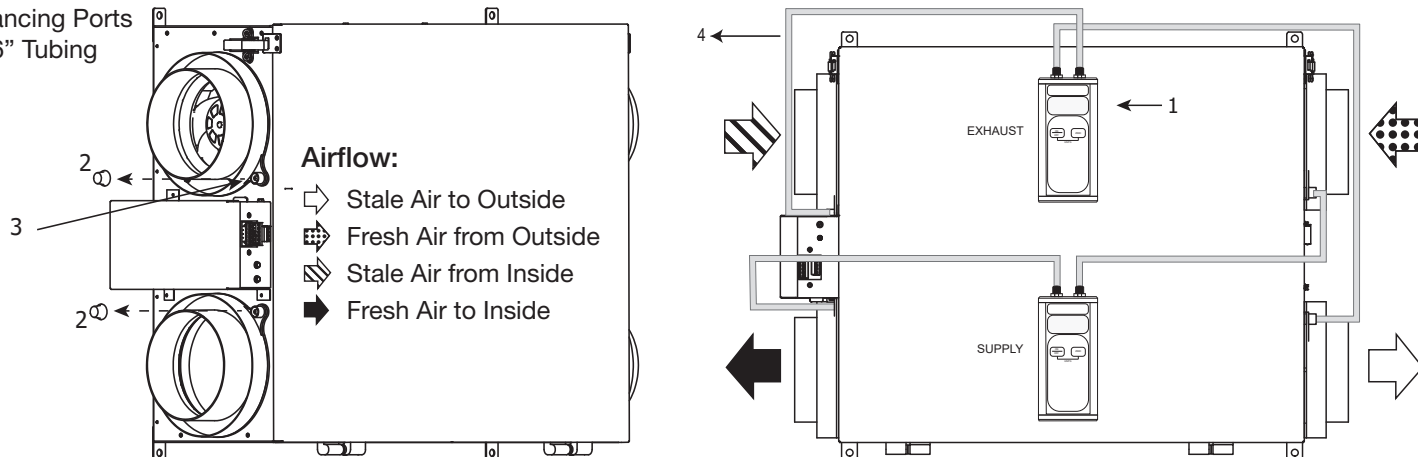


Figure 36. Balancing the Airflows - Collar Port Method

1. Prepare the pressure measuring device by connecting two hoses to the low and high pressure connections on the device. The illustrations show a digital manometer.
2. Ensure that the balancing ports located on the interior of the unit’s collars are plugged (open unit’s door to gain access to interior of unit’s collars).
3. Close door, initiate power and operate the ERV on high speed. Operate the forced air system on high speed if the ERV is connected to the forced air system.
4. Remove the protective covers on the exhaust stream balancing ports located on the exterior of the unit’s collars. Connect the two hoses from the measuring device to the two balancing ports on the exhaust stream collars. Record your reading. If you read a negative value, the two hoses need to be reversed. Re-plug collars.
5. Remove the protective covers on the supply stream balancing ports located on the exterior of the unit’s collars. Connect the two hoses from the measuring device to the two balancing ports on the supply stream collars. Record your reading. If you read a negative value, the two hoses need to be reversed. Re-plug collars.
6. Refer to the “Airflow Charts for Collar Port on ASSURE140” on page 31 and determine the supply and exhaust airflow rates.
7. Damper down the higher airflow and repeat steps 4 through 7 as required until both airflows are suitably balanced.
8. Remove pressure measuring device and reinstall the four protective covers on the exterior of unit’s collars.

## Collar Port Locations - ASSURE140

### Door Ports (Standard):

1. Supply Balance Port Low (-)
2. Supply Balance Port High (+)
3. Exhaust Balance Port Low (-)
4. Exhaust Balance Port High (+)



### Airflow (Standard):

- ⇨ Stale Air to Outside
- ⇦ Fresh Air from Outside
- ⇨ Stale Air from Inside
- ⇦ Fresh Air to Inside

### Door Ports (Mirrored):

1. Exhaust Balance Port Low (-)
2. Exhaust Balance Port High (+)
3. Supply Balance Port Low (-)
4. Supply Balance Port High (+)

### Airflow (Mirrored):

- ⇨ Fresh Air to Inside
- ⇦ Stale Air from Inside
- ⇨ Fresh Air from Outside
- ⇦ Stale Air to Outside

# Airflow Charts for Collar Port Balancing on ASSURE140

Hi 3				Hi 2				Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow	Pressure Drop		Supply Airflow	Exhaust Airflow	Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)	("w.g.)	(Pa)	(cfm)	(cfm)	("w.g.)	(Pa)	(cfm)	(cfm)
0.00	0	169	177	0.00	0	147	155	0.00	0	135	139
0.05	12	164	171	0.05	12	141	149	0.05	12	129	132
0.10	25	158	165	0.10	25	135	142	0.10	25	123	126
0.15	37	152	158	0.15	37	129	136	0.15	37	117	119
0.20	50	147	152	0.20	50	123	129	0.20	50	110	113
0.25	62	141	146	0.25	62	117	123	0.25	62	104	106
0.30	75	135	139	0.30	75	111	116	0.30	75	98	100
0.35	87	129	133	0.35	87	105	109	0.35	87	92	93
0.40	100	123	127	0.40	100	99	103	0.40	100	86	87
0.45	112	117	120	0.45	112	93	96	0.45	112	80	80
0.50	125	111	113	0.50	125	87	90	0.50	125	74	74
0.55	137	105	107	0.55	137	81	83	0.55	137	67	67
0.60	150	98	100	0.60	150	75	76	0.60	150	61	61
0.65	162	92	93	0.65	162	69	70	0.65	162	55	54
0.70	174	86	86	0.70	174	63	63	0.70	174	49	48
0.75	187	79	79	0.75	187	57	57	0.75	187	43	41
0.80	199	73	72	0.80	199	51	50	0.80	199	37	35
0.85	212	66	65	0.85	212	45	44	0.85	212	30	28
0.90	224	59	58	0.90	224	39	37	0.90	224	24	22
0.95	237	53	51	0.95	237	33	30	0.95	237	18	16
1.00	249	46	43	1.00	249	27	24	1.00	249	12	9
1.05	262	39	36	1.05	262	21	17	1.05	262	6	
1.10	274	32	29	1.10	274	15	11	1.10	274		
1.15	287	25	21	1.15	287	9	4	1.15	287		
1.20	299	18	14	1.20	299			1.20	299		
1.25	311	11	6	1.25	311			1.25	311		
1.30	324	4		1.30	324			1.30	324		



# Troubleshooting

**Table 13. Troubleshooting**

Symptom	Cause	Solution
Poor airflow(s)	<ul style="list-style-type: none"> <li>• Mesh on outside hoods plugged</li> <li>• Filters plugged</li> <li>• Core obstructed</li> <li>• House grilles closed or blocked</li> <li>• Dampers closed (if installed)</li> <li>• Poor power supply at site</li> <li>• Ductwork is restricting ERV</li> <li>• Improper speed control setting</li> <li>• ERV airflow improperly balanced</li> </ul>	<ul style="list-style-type: none"> <li>• Clean exterior hoods or vents</li> <li>• Remove and clean both filter and core</li> <li>• If unit is equipped with MERV 13 filters, replace every 3 months.</li> <li>• Check and open grilles</li> <li>• Open and adjust dampers</li> <li>• Have electrician check supply voltage at house</li> <li>• Check duct installation</li> <li>• Increase the speed of the ERV</li> <li>• Have contractor balance the ERV</li> </ul>
Supply air feels cold	<ul style="list-style-type: none"> <li>• Poor location of supply grilles</li> <li>• Airflow may irritate occupants</li> <li>• Outdoor temperature extremely cold</li> </ul>	<ul style="list-style-type: none"> <li>• Locate the grilles high on the walls or under the baseboards</li> <li>• Install ceiling mounted diffuser or grilles so as not to direct airflow onto occupants (e.g. over a couch)</li> <li>• Turn down the ERV supply speed</li> <li>• A small duct heater (1kw) could be used to temper the supply air</li> <li>• Placement of furniture or closed doors restricting movement of air in home; consider rearranging</li> <li>• If supply air is ducted into furnace return, the furnace fan may need to run continuously to distribute ventilation air comfortably</li> </ul>
Dehumidistat is not operating	<ul style="list-style-type: none"> <li>• Outdoor temperature is above 59°F (15°C)</li> <li>• Improper low-voltage connection</li> <li>• External low voltage is shorted out by a staple or nail</li> <li>• Check dehumidistat setting; it may be OFF</li> </ul>	<ul style="list-style-type: none"> <li>• Dehumidistat is functioning normally (see “Dehumidistat Disable” on page 10)</li> <li>• Check that the correct terminals have been used</li> <li>• Check external wiring for a short</li> <li>• Set the dehumidistat at the desired level</li> </ul>
Humidity levels are too high; condensation is appearing on windows	<ul style="list-style-type: none"> <li>• Dehumidistat set too high</li> <li>• ERV unit is undersized to handle a hot tub, indoor pool, etc. (Occupant Lifestyle)</li> <li>• Moisture coming into the home from a non-vented or non-heated crawl space</li> <li>• Moisture remaining in washroom and/or kitchen areas</li> <li>• Condensation seems to form in the spring and fall seasons</li> <li>• ERV is set at too low a speed</li> </ul>	<ul style="list-style-type: none"> <li>• Set dehumidistat at lower level</li> <li>• Cover pool or hot tub when not in use</li> <li>• Avoid hanging clothes to dry indoors, storing wood indoors, and venting dryer inside</li> <li>• Vent crawl space and place a vapor barrier on the floor of the crawl space</li> <li>• Ducts from washroom should be sized to remove moist air as effectively as possible; use of a bathroom fan for short periods will remove additional moisture</li> <li>• On humid days, as seasons change, some condensation may appear but the home’s air quality will remain high with some ERV use</li> <li>• Increase speed of ERV</li> </ul>
Humidity levels are too low	<ul style="list-style-type: none"> <li>• Dehumidistat control set too low</li> <li>• Blower speed of ERV is too high</li> <li>• Occupant lifestyle issue</li> <li>• ERV airflows may be improperly balanced</li> </ul>	<ul style="list-style-type: none"> <li>• Set dehumidistat at higher level.</li> <li>• Decrease ERV blower speed</li> <li>• Humidity may have to be added through use of humidifiers</li> <li>• Have a contractor balance ERV airflows</li> </ul>
ERV units and/or ducts frosting up	<ul style="list-style-type: none"> <li>• ERV air flows are improperly balanced</li> <li>• Malfunction of the ERV defrost system</li> </ul>	<ul style="list-style-type: none"> <li>• NOTE: Minimal frost build-up is expected on cores before unit initiates defrost cycle.</li> <li>• Have HVAC contractor balance the ERV airflows</li> <li>• Ensure damper defrost is operating during self-test</li> </ul>
Condensation or ice build-up in insulated duct to the outside	<ul style="list-style-type: none"> <li>• Incomplete vapor barrier around insulated duct</li> <li>• Hole or tear in outer duct covering</li> </ul>	<ul style="list-style-type: none"> <li>• Tape and seal all joints</li> <li>• Tape any holes or tears made in the outer duct covering</li> <li>• Ensure that the vapor barrier is complete sealed</li> </ul>
Water in the bottom of the ERV unit	<ul style="list-style-type: none"> <li>• Drain pans plugged</li> <li>• Improper connection of ERV drain lines</li> <li>• ERV is not level</li> <li>• Drain lines obstructed</li> <li>• ERV heat exchange core is not properly installed</li> </ul>	<ul style="list-style-type: none"> <li>• Look for kinks in the drain line</li> <li>• Check water drain connections</li> <li>• Make sure water drains properly from pan(s)</li> </ul>

## Homeowner Maintenance Information

### **WARNING**



Electric Shock Hazard.

Can cause injury or death.

Disconnect all remote electrical power supplies before servicing.

Unit may have multiple power supplies. Unit must be connected to a grounded power supply in accordance with national and local codes.

1. Inspect exterior hoods and vents at least once a month and make sure exhaust and fresh air supply hoods are not blocked or restricted by leaves, grass, or snow. In winter, it is especially important to make sure snow is not blocking the hoods or that frost has not built up on the wire mesh (bird screen).

### **IMPORTANT**

Blockage of hoods or vents may cause an airflow imbalance.

2. Clean or replace air filters 4 times a year. Clean factory provided MERV 6 polyester filter and replace MERV 13 paper framed filter:
  - a. Disconnect power to the unit.
  - b. Open access door.
  - c. Slide the core out slightly.
  - d. Remove filter clips if present.
  - e. Remove filters off the core.
  - f. Rinse filters with water or a combination of mild soap and water. Do not clean in the dishwasher (not applicable for MERV 13 filters).
  - g. To reassemble, place clean filter(s) – wet or dry – back into their positions against the core and return clips to their original position.
  - h. Slide core back into its original position.
3. Clean core and inside of cabinet 2 times a year
  - a. Disconnect power to the unit.
  - b. Open access door.
  - c. Carefully grip ends of core and pull evenly outward. Core may be snug, but will slide out of the channel.
  - d. Remove filters as above.
  - e. ERV Core - vacuum ONLY to clean core, do not get wet.
  - f. Install clean filters.
  - g. Wipe down the inside of the cabinet with a damp cloth to remove dirt, bugs, and any debris.
4. Install clean core as follows:
  - a. Install the bottom flange of the core guide into the bottom H channel approximately 1/4" (6 mm).
  - b. Install the left or right side flange of the core guide approximately 1/4" (6 mm) followed by the other side flange.
  - c. Install the top flange of the core guide into the top H channel approximately 1/4" (6 mm).
  - d. With all four corners in place and the core straight and even, push hard in the center of the core until the core stops on the back of the cabinet.

NOTE: Core will appear to stick out from cabinet approximately 1/8" (3 mm). This is designed this way so that the access door will fit tight against the core.

### **IMPORTANT**

Vacuum ONLY to clean ERV core.

5. Clean drain (condensate) line 2 times a year. Inspect drain line, drain spout, and P-trap for blockage, mold, or kinks in the line. Flush with warm soapy water and replace line if worn, bent, or cannot be cleaned.
6. Clean duct system if required. The duct system may accumulate dirt. Wipe and vacuum the inside of the duct once every year. (A capable HVAC service company will best perform this procedure.)
7. Motors are maintenance free, however, impeller blades must be cleaned.

NOTE: Impellers may accumulate dirt causing an imbalance and/or excessive vibration of the ERV unit. A reduction in the airflow may also occur. In new construction, this may result within the first year due to heavy dust.

  - a. Disconnect power to the unit.
  - b. Open access door.
  - c. Remove the core.
  - d. Remove ducting (metal and/or flexible insulated type) from the ports which are connected immediately in-line with the fan assembly
  - e. Use a small brush and scrub individual fan blades until clean. Avoid moving or damaging balancing flat weight (clip is usually found on one or more of the fan blades).
  - f. Vacuum and wipe out.
  - g. Reassemble. Be sure ducting is attached firmly. Seal and tape insulation and moisture barrier.

A capable HVAC service company will best perform this procedure.



# Replacement Parts Summary

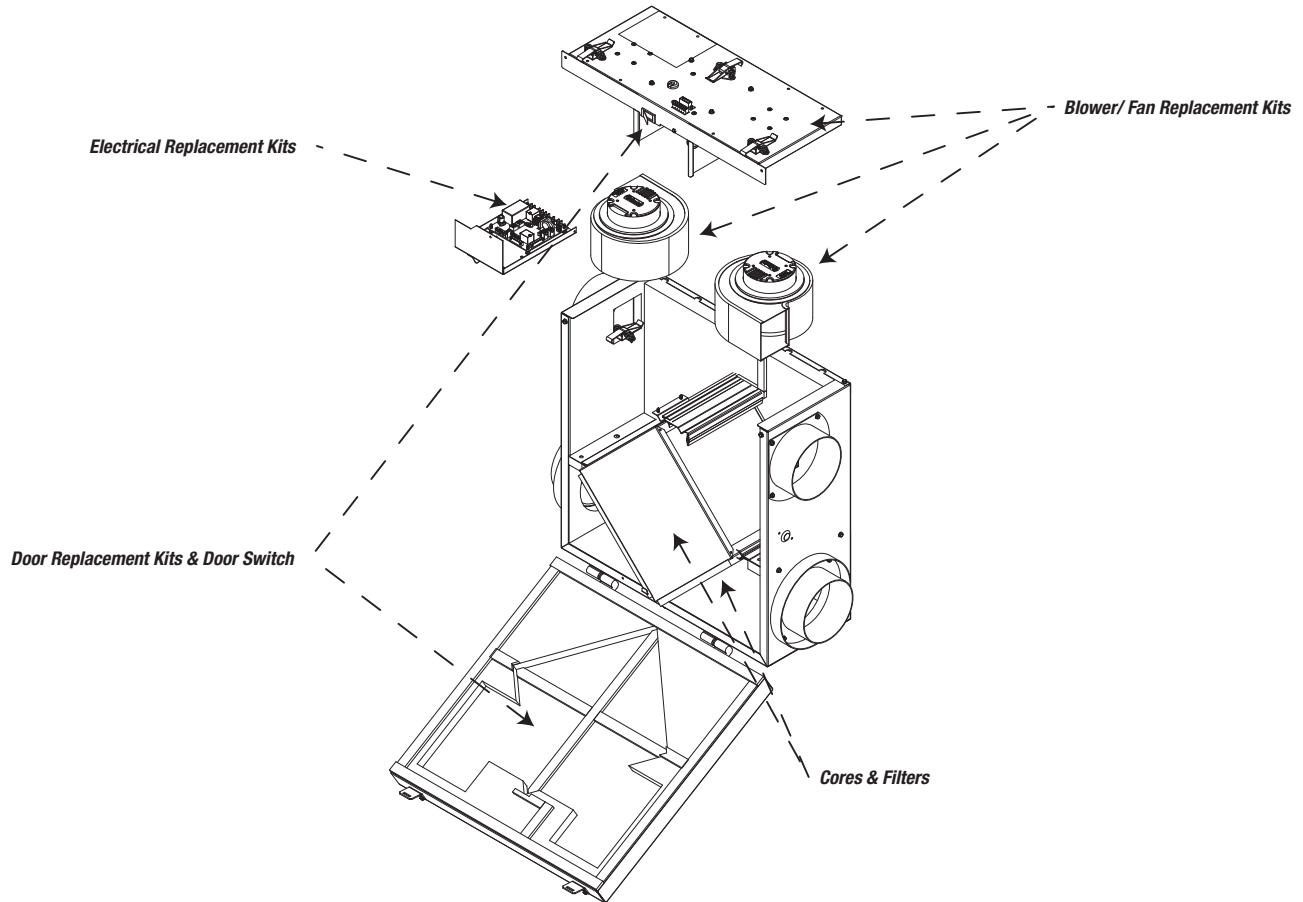


Figure 37. Replacement Components

**Table 14. Replacement Parts Summary**

Replacement Part Description	First Character of Serial Number Alpha Code*	ASSURE120	ASSURE140
MERV-6 Filters (Packs of 2)	Blank, E, F or B	485462	485464
MERV-13 Filters (Packs of 4)	Blank, E, F or B	485463	485465
Motorized Impeller (Cap included if needed)	Blank or E	387474	388187
	F	387990	388188
Fan Panel Assembly	Blank or E	387474	N/A
	F	486265	N/A
Core Assembly	Blank, E, F or B	387470	387471
Transformer and Circuit Board	Blank, E, F or B	387469	387469
Thermistor	Blank, E, F or B	387465	387465
Latch/Keeper	Blank, E, F or B	485620	485620
Hinge Set (qty: 2)	Blank, E, F or B	485619	485619
Accessories Bag	Blank, E, F or B	485618	485657

\* Refer to "Serial Number Nomenclature Breakdown" for more information on the unit Serial Number on page 34.

## Serial Number Nomenclature Breakdown

Each Serial Number begins with a 2-character alpha code followed by an 11-digit number code.

Example Serial number:

X-01012412345

└─▶ The first 6 digits represent the manufactured date following MMDDYY.

Therefore, this model would be a unit manufactured on January 1st, 2024.

## Our Commitment

*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*

Product warranties can be found online at [Greenheck.com](https://www.greenheck.com), either on the specific product page or in the literature section of the website at [Greenheck.com/Resources/Library/Literature](https://www.greenheck.com/Resources/Library/Literature).

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at [www.amca.org](http://www.amca.org).

