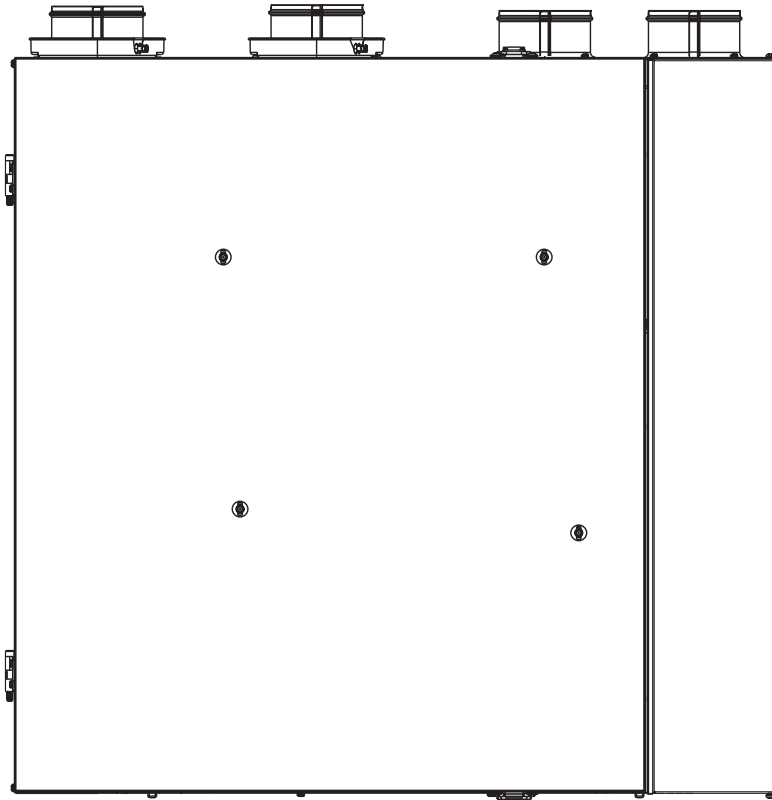




## INSTALLATION GUIDE



VB0185

**IN THIS REVISION:**  
New information about  
extended defrost setting on  
page 16.

### IMPORTANT NOTES

1. The one and only main wall control compatible with these units is the VT9W wall control.
2. These units have a new balancing procedure, see Section 7.
3. The terminal connectors for these units are not in the installation kit; they are already mounted to their control board.

**ERV200 ECM**  
**ERV250 ECM**

**HRV200 ECM**  
**HRV250 ECM**

△ RESIDENTIAL USE ONLY △

**READ AND SAVE THESE INSTRUCTIONS**

Broan-NuTone LLC; Hartford, Wisconsin    [www.broan-nutone.com](http://www.broan-nutone.com)    800-558-1711

REGISTER YOUR PRODUCT ONLINE AT: [www.broan-nutone.com/register](http://www.broan-nutone.com/register)

For additional information - visit [www.broan-nutone.com](http://www.broan-nutone.com)



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21992 rev. F

## ABOUT THIS GUIDE

Because of the large amount of models covered in this publication, the illustrations are typical ones. Some details of your unit may be slightly different than the ones shown.

Please take note that this guide uses the following symbols to emphasize particular information:

### **WARNING**

**Identifies an instruction which, if not followed, might cause serious personal injuries including possibility of death.**

### **CAUTION**

**Denotes an instruction which, if not followed, may severely damage the unit and/or its components.**

NOTE: Indicates supplementary information needed to fully complete an instruction.

## ABOUT THESE UNITS

### LIMITATION

For residential (domestic) installation only. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.

### **WARNING**

**TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSON(S) OBSERVE THE FOLLOWING:**

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number listed in the warranty.
2. We recommend that your unit be inspected by a specialized technician once a year.
3. Before servicing or cleaning the unit, disconnect power cord from electrical outlet.
4. This unit is not designed to provide combustion and/or dilution air for fuel-burning appliances.
5. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
6. Do not use the units with any solid-state speed control device other than the corresponding ones listed below:

UNIT	MAIN CONTROL	AUXILIARY CONTROL
ERV200 ECM, ERV250 ECM, HRV200 ECM, HRV250 ECM	VTW9 <b>EXCLUSIVELY</b>	VBATHW

7. This unit must be grounded. The power supply cord has a 3-prong grounding plug for your personal safety. It must be plugged into a mating 3-prong grounding receptacle, grounded in accordance with the national electrical code and local codes and ordinances. Do not remove the ground prong. Do not use an extension cord.
8. Do not install in a cooking area or connect directly to any appliances.
9. Do not use to exhaust hazardous or explosive materials and vapors.
10. When performing installation, servicing or cleaning these units, it is recommended to wear safety glasses and gloves.
11. Due to the weight of the unit, two installers are recommended to perform installation.
12. When applicable local regulations comprise more restrictive installation and/or certification requirements, the aforementioned requirements prevail on those of this document and the installer agrees to conform to these at his own expenses.

### **CAUTION**

1. To avoid premature clogged filters, turn OFF the unit during construction or renovation.
2. Please read specification label on product for further information and requirements.
3. Be sure to duct air outdoors – Do not intake/exhaust air into spaces within walls or ceiling or into attics, crawl spaces, or garage.
4. Intended for residential installation only in accordance with the requirements of NFPA 90B (for a unit installed in USA).
5. Do not run any air ducts directly above or closer than 2 ft (0.61 m) to any furnace or its supply plenum, boiler, or other heat producing appliance. If a duct has to be connected to the furnace return plenum, it must be connected not closer than 9' 10" from this plenum connection to the furnace.
6. The ductwork is intended to be installed in compliance with all applicable codes.
7. When leaving the house for a long period of time (more than two weeks), a responsible person should regularly check if the unit operates adequately.
8. If the ductwork passes through an unconditioned space (e.g.: attic), the ducts must be insulated, and the unit must operate continuously except when performing maintenance and/or repair. Also, the ambient temperature of the house should never drop below 65°F.
9. Do not make excessive use of fragrance appliances or chemicals since some may damage the unit components material.

## TECHNICAL SUPPORT

FOR ASSISTANCE, CALL ON WEEKDAYS, 8:30 AM TO 5:00 PM (EASTERN STANDARD TIME): 1-800-558-1711.

**NOTE:** THIS PHONE NUMBER IS STRICTLY RESERVED FOR INSTALLERS USE ONLY. Do not call this number for ordering parts.

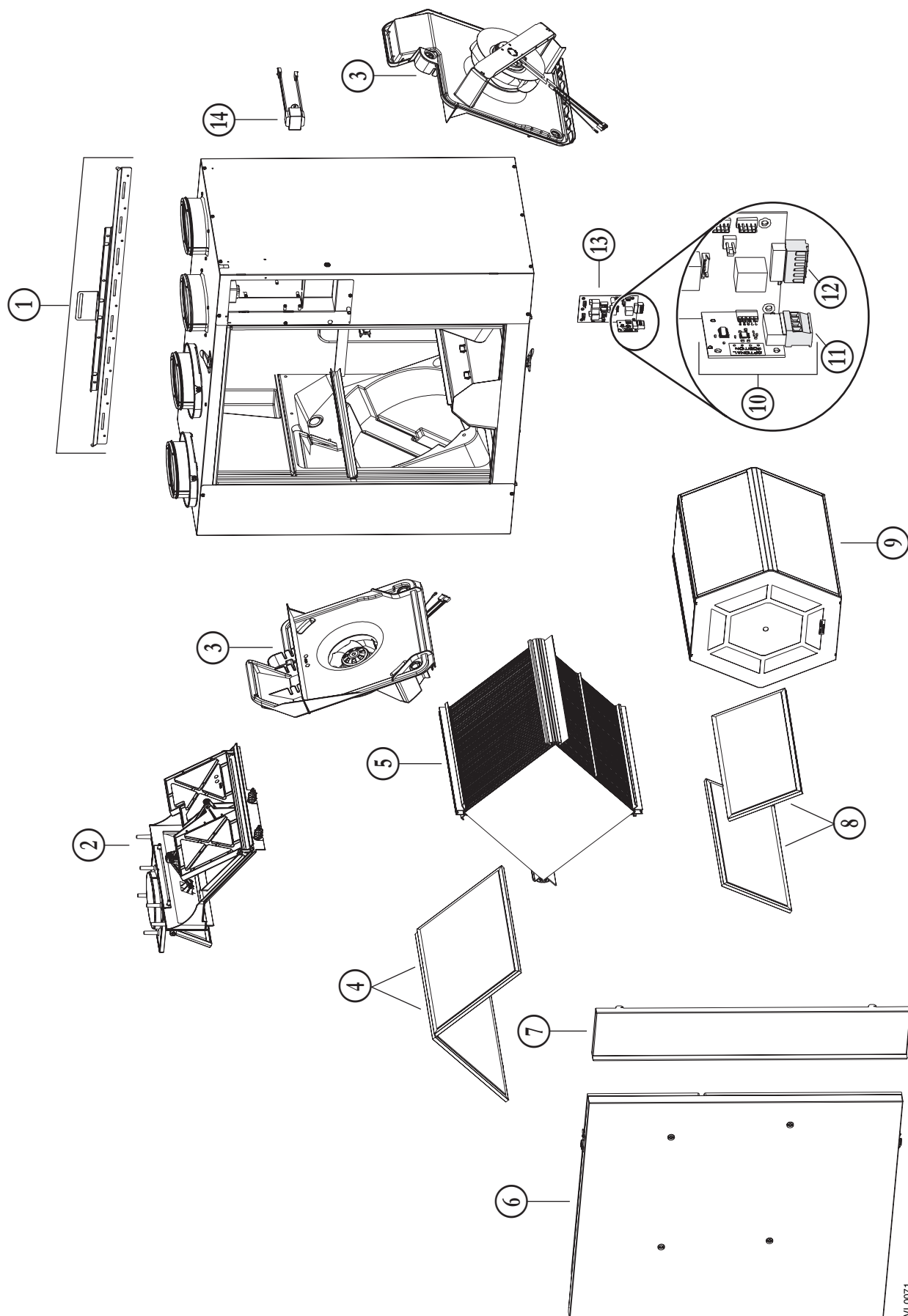
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## TABLE OF CONTENTS

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1. SERVICE PARTS .....	4-5
2. AIR DISTRIBUTION .....	6
3. INSTALLATION .....	6-12
3.1 INSPECT THE CONTENT OF THE BOX .....	6
3.2 LOCATING THE UNIT .....	6-7
3.3 PLANNING OF THE DUCTWORK .....	8
3.4 DUCT SIZE .....	8
3.5 INSTALLING THE DUCTWORK AND REGISTERS .....	8-10
3.6 CONNECTING THE DUCTS TO THE UNIT .....	11
3.7 INSTALLING TWO EXTERIOR HOODS .....	12
3.8 CONNECTING THE DRAIN .....	12
4. CONTROLS.....	13-16
4.1 UNITS BOOTING SEQUENCE .....	13
4.2 WALL CONTROL(S) ELECTRICAL CONNECTION .....	13-15
4.3 SETTING UNIT OPERATION IN THE REMAINING 40 MINUTES ON 20 MIN/H MODE AND SETTING UNIT DEFROST CYCLE TYPE USING VT9W MAIN WALL CONTROL.....	16
5. ELECTRICAL CONNECTION TO THE FURNACE .....	17
6. WIRING DIAGRAM.....	18
7. BALANCING THE UNIT.....	19-24
7.1 WHAT YOU NEED TO BALANCE THE UNIT .....	19
7.2 PRELIMINARY STAGES TO BALANCE THE UNIT.....	19
7.3 USING MAGNEHELIC GAUGES.....	19
7.4 BALANCING CHART AND PRESET SPEEDS TABLE .....	19-20
7.5 BALANCING PROCEDURE .....	21-24
8. TROUBLESHOOTING.....	25-27

## 1. SERVICE PARTS



VL0071

## 1. SERVICE PARTS (CONT'D)

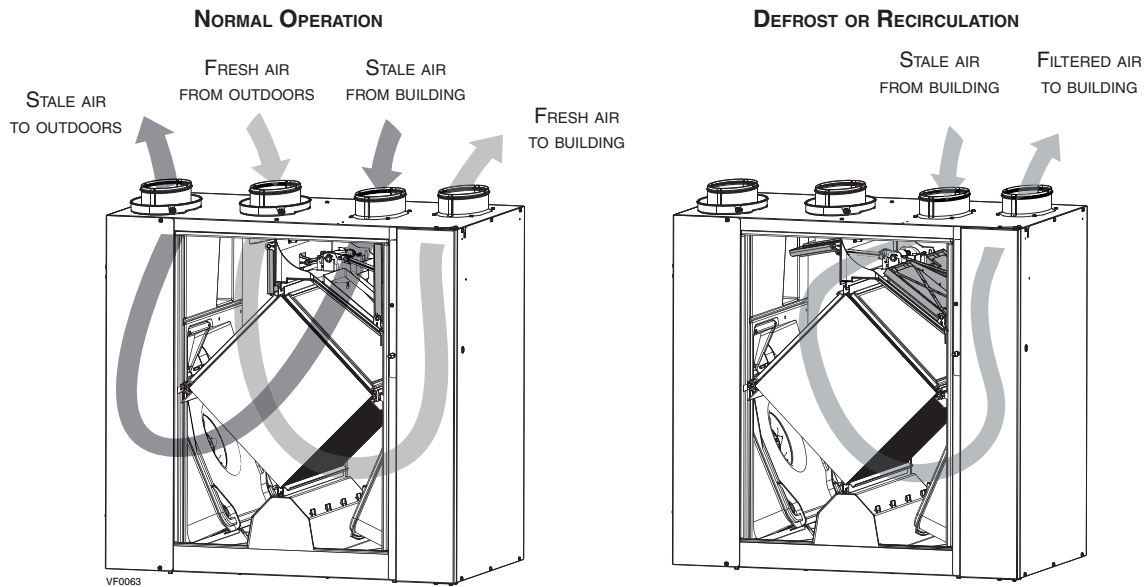
No.	DESCRIPTION	QTY.	ERV200 ECM	HRV200 ECM	ERV250 ECM	HRV250 ECM
1	BRACKET KIT	1	SV63419	SV63419	SV63419	SV63419
2	DAMPER SYSTEM ASSEMBLY (INCLUDING 2 PLASTIC SCREWS)	1	SV63420	SV63420	SV63420	SV63420
3	BLOWER ASSEMBLY (INCLUDING 3 PLASTIC SCREWS)	2	SV63421	SV63421	SV63421	SV63421
4	HRV CORE FILTER (PAIR)	1		SV63426		SV63426
	ERV CORE FILTER (PAIR)	1			SV63433	
5	HEAT RECOVERY CORE	1		SV63422		SV63423
	ENERGY RECOVERY CORE	1			SV63425	
6	DOOR ASSEMBLY (INCLUDING NO. 16)	1	SV63569	SV63569	SV63569	SV63569
7	RIGHT PANEL	1	SV63565	SV63566	SV63567	SV63568
8	ERV CORE FILTER (PAIR)	1	SV63427			
9	ENERGY RECOVERY CORE	1	SV63424			
10	DAUGHTER BOARD (INCLUDING NO. 11)	1	SV63437	SV63437	SV63437	SV63437
11	PCB CONNECTOR (MAIN CONTROL)	1	SV63434	SV63434	SV63434	SV63434
12	PCB CONNECTOR (AUXILIARY CONTROL)	1	SV63435	SV63435	SV63435	SV63435
13	PCB (INCLUDING NOS. 10 & 12)	1	SV63436	SV63441	SV63442	SV63443
14	TRANSFORMER	1	SV63438	SV63438	SV63438	SV63438
15	WARM SIDE THERMISTOR KIT*	1	SV62481	SV62481	SV62481	SV62481
16	DOOR MAGNETIC SWITCH*	1	SV19060	SV19060	SV19060	SV19060
17	PLASTIC SCREW (SET OF 6)*	1	SV63439	SV63439	SV63439	SV63439
18	HARDWARE KIT*	1	SV22488	SV22488	SV22488	SV22488

\* Not shown.

### REPLACEMENT PARTS AND REPAIR

In order to ensure your ventilation unit remains in good working condition, you must use the Broan-Nutone LLC genuine replacement parts only. The Broan-NuTone LLC genuine replacement parts are specially designed for each unit and are manufactured to comply with all the applicable certification standards and maintain a high standard of safety. Any third party replacement part used may cause serious damage and drastically reduce the performance level of your unit, which will result in premature failing. Broan-NuTone LLC recommends to contact a Broan-NuTone LLC certified service depot for all replacement parts and repairs.

## 2. AIR DISTRIBUTION



### Consumer Information

A. To ensure quiet operation of the H/ERV, each product model must be installed using sound attenuation techniques appropriate for the installation.

B. The way your heat/energy-recovery ventilator is installed can make a significant difference to the electrical energy you use. To minimize the electricity use of the heat/energy-recovery ventilator, a stand-alone fully ducted installation is recommended. If you choose a simplified installation that operates your furnace air handler for room-to-room ventilation, an electrically efficient furnace that has an electronically commutated (EC) variable speed blower motor will minimize your electrical energy consumption and operating cost.

C. Installation of a user-accessible control with your product model will improve comfort and may significantly reduce the product model's energy use.

## 3. INSTALLATION

### 3.1 INSPECT THE CONTENT OF THE BOX

Inspect the exterior of the unit for shipping damage. Ensure that there is no damage to the door, ports, power cord, etc.

#### CAUTION

**Make sure that no piece of mineral wool will enter in the unit during installation. Otherwise, this could reduce airflow and generate vibrations and noise in the unit.**

### 3.2 LOCATING THE UNIT

Choose an appropriate location for the unit.

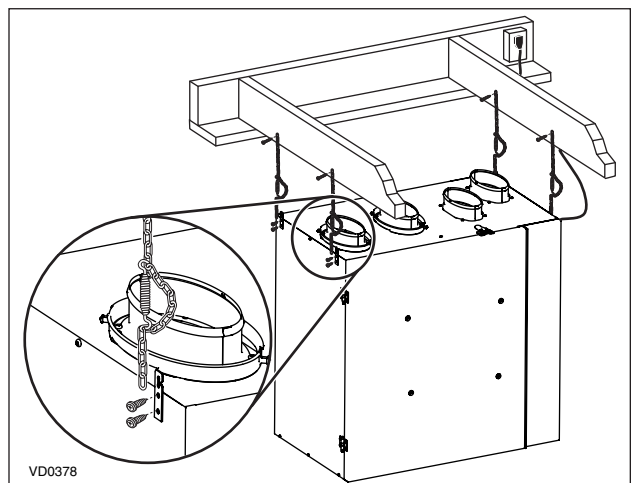
- Within an area of the house **where the ambient temperature is kept between 50°F and 104°F**.
- Away from living areas (dining room, living room, bedroom), if possible.
- So as to provide easy access to the interior of the unit, for regular and annual maintenance.

NOTE: There must be a 27" clearance in front of the unit to fully open the door. In limited space, the door can be removed by lifting it up, but there must be a 18" clearance in front of the unit to remove the core.

- Close to an exterior wall, so as to limit the length of the insulated flexible duct to and from the unit.
- Away from hot chimneys and other fire hazards.
- Allow for a power source (standard 3-prong grounding outlet).
- Close to a drain. If no drain is close by, use a pail to collect run-off.

The unit can be hung using provided 4 chains and springs (see at right) or hung to the wall using provided brackets (see next page).

#### UNIT HUNG BY CHAINS AND SPRINGS



#### CAUTION

**In every case, make sure the unit is level.**

### 3. INSTALLATION (CONT'D)

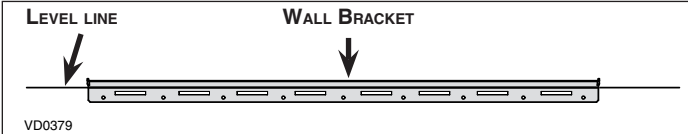
#### 3.2 LOCATING THE UNIT (CONT'D)

##### UNIT HUNG TO WALL BRACKET

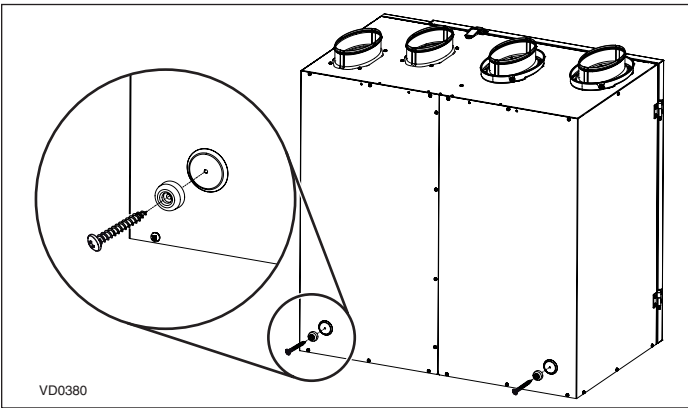
Trace a level line on the wall; align the wall bracket (the longer one) to the line and secure this bracket to the wall using 4 provided screws (1½" long) and washers, if using the slots on bracket).

##### ⚠ WARNING

**Ensure the wall bracket is attached to all of the available studs, not into the drywall alone.**



Using 1½" long provided screws, assemble both spacers to left and right back bottom corner of the unit.



##### CAUTION

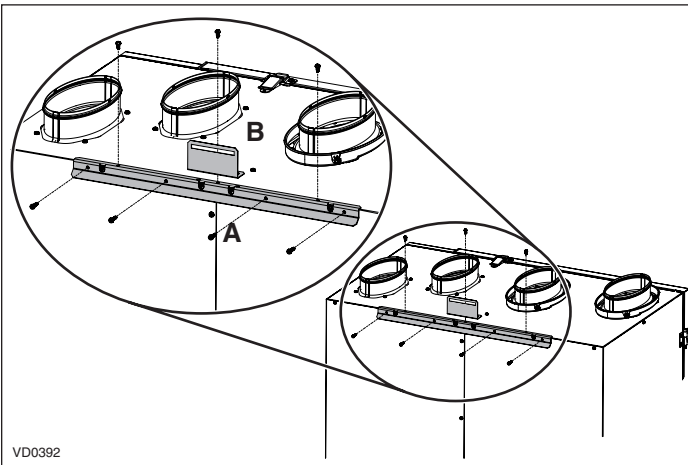
**Never use an electric screwdriver or drill to screw the brackets to the unit; use a standard screwdriver.**



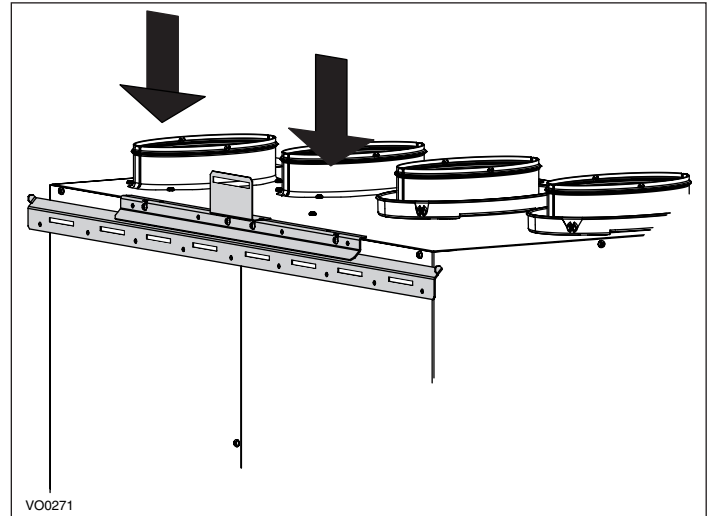
VR0086

Using 3/8" long provided screws, mount the other bracket (A) to the back of the unit; start with the 4 back screws, then 2 screws on top left and right sides, then use the last center one to assemble the last small bracket (B).

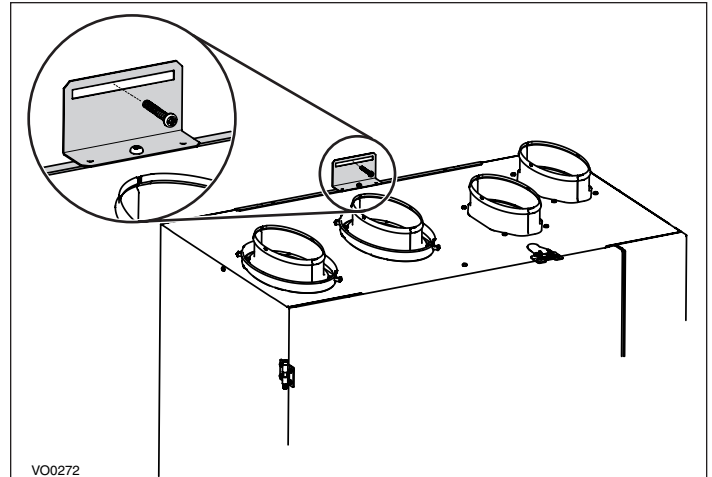
NOTE: These screws must be hand tightened.



Lift the unit and hang it to the wall bracket. Ensure the bracket assembled on back of the unit rests on the wall bracket.



Secure the unit to the wall using one 1½" long provided screw through the small bracket.



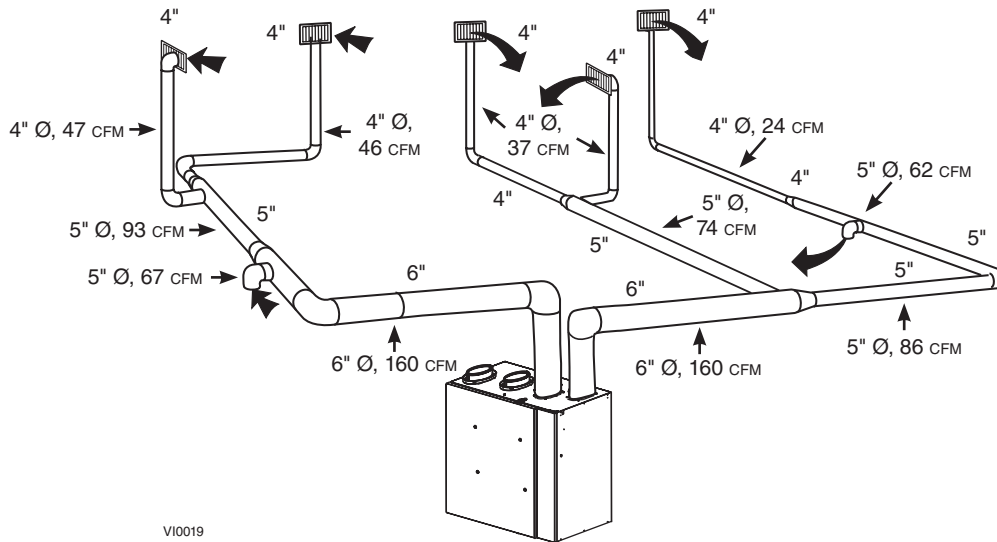
### 3. INSTALLATION (CONT'D)

#### 3.3 PLANNING OF THE DUCTWORK

- Keep it simple. Plan for a minimum of bends and joints.
- Keep the length of insulated and non-insulated ducts to a minimum, because the length of the ductwork impacts directly the unit airflow performances.
- Do not ventilate crawl spaces or cold rooms. Do not attempt to recover the exhaust air from a dryer or a range hood. This would cause clogging of the filters and recovery module.
- If the house has two floors or more, be sure to plan for at least one exhaust register on the highest lived-in level.

#### 3.4 DUCT SIZE

To determine the appropriate duct size to be used, refer to the ASHRAE or HRAI HANDBOOK. Below is an example of a design for a fully ducted system with a unit having a high speed performance of 160 cfm.



#### 3.5 INSTALLING THE DUCTWORK AND REGISTERS

##### 3.5.1 FULLY DUCTED SYSTEM

#### ⚠ WARNING

**Never install a stale air exhaust register in a closed room where a combustion device operates, such as a gas furnace, a gas water heater or a fireplace.**

#### CAUTION

**If ducts have to go through an unconditioned space (e.g.: attic), always use insulated ducts to prevent condensation formation inside and outside ducts, which could cause material damage and/or mold growth. Moreover, if fresh air to building duct and/or stale air from building duct goes/go through an unconditioned space, the unit must be set to operate continuously in cold conditions (below 10°C/50°F). Continuous air movement inside ducts will prevent condensation formation. The unit can be stopped temporarily for maintenance and/or repair purposes in such conditions.**

##### Stale air exhaust ductwork

- Install the stale air exhaust registers where the contaminants are produced: kitchen, living room, etc. Position the registers as far from the stairway as possible and in such a way that the air circulates in all the lived-in spaces in the house.
- If a register is installed in the kitchen, it must be located at least 4 feet from the range.
- Install the registers 6 to 12 inches from the ceiling on an interior wall OR install them in the ceiling.
- If possible, measure the velocity of the air flowing through the registers. If the velocity is higher than 400 ft/min, then the register type is too small. Replace with a larger one.

##### Fresh air distribution ductwork

- Install the fresh air distribution registers in bedrooms, dining rooms, living room and basement.
- Keep in mind that the fresh air registers must be located as far as possible from the stale air registers.
- Install the registers either in the ceiling or high on the walls with air flow directed towards the ceiling. (The cooler air will then cross the upper part of the room and mix with room air, before descending to occupant's level.)
- If a register must be floor installed, direct the airflow up the wall.



### 3. INSTALLATION (CONT'D)

#### 3.5 INSTALLING THE DUCTWORK AND REGISTERS (CONT'D)

##### 3.5.2 CENTRAL DRAW POINT SYSTEM

##### Stale air exhaust ductwork

Same as for Fully Ducted System, described on point 3.5.1

#### ⚠ WARNING

When performing duct connections, always use approved tools and materials. Respect all corresponding laws and safety regulations. Please refer to your local building code.

#### CAUTION

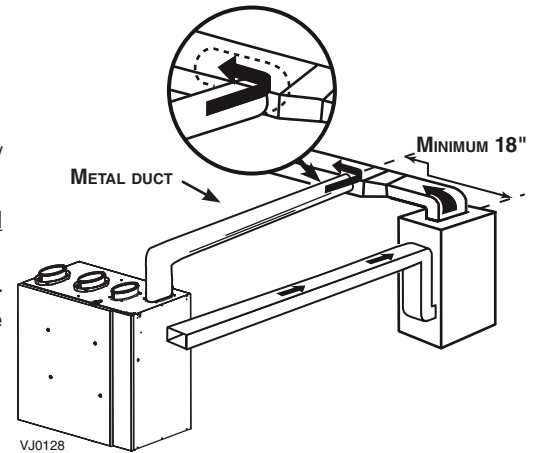
When performing duct connections to the furnace supply duct, this duct must be sized to support the additional airflow produced by the unit. Also, the use of metal duct is highly recommended.

##### Fresh air distribution ductwork

- There are 2 methods for connecting the unit to the furnace/air handler:

##### Method 1: Supply side connection

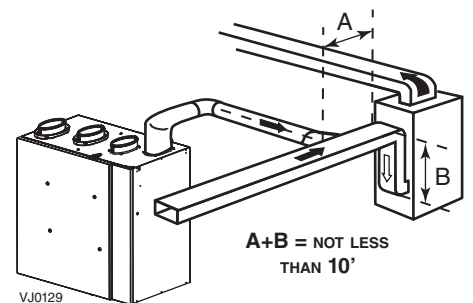
- Cut an opening into the furnace supply duct at least 18 inches from the furnace/air handler.
- Connect this opening to the **Fresh air distribution** port of the unit (use **metal duct**, see figure at right).
- Make sure the unit duct forms an elbow inside the furnace/air handler ductwork.
- If desired, interlock (synchronize) the furnace/air handler blower operation (see Section 5 ELECTRICAL CONNECTION TO THE FURNACE).



##### Method 2: Return side connection

- Cut an opening into the furnace return duct not less than 10 feet from the furnace/air handler (A+B).
- Connect this opening to the **Fresh air distribution** port of the unit (see figure at right).

NOTE: For Method 2, it is not essential that the furnace/air handler runs when the unit is operation, but we recommend it. If desired, interlock (synchronize) the furnace/air handler blower operation (see Section 5 ELECTRICAL CONNECTION TO THE FURNACE).



### 3. INSTALLATION (CONT'D)

#### 3.5 INSTALLING THE DUCTWORK AND REGISTERS (CONT'D)

##### 3.5.3 SIMPLIFIED INSTALLATION

#### ⚠ WARNING

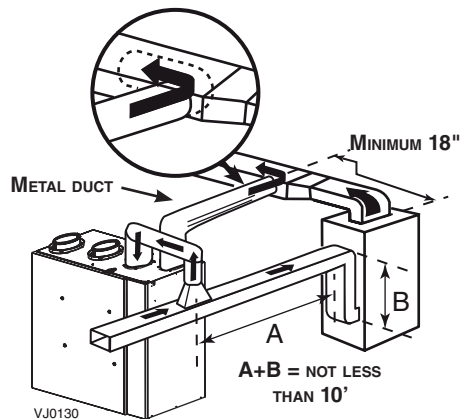
When performing duct connections, always use approved tools and materials. Respect all corresponding laws and safety regulations. Please refer to your local building code.

#### CAUTION

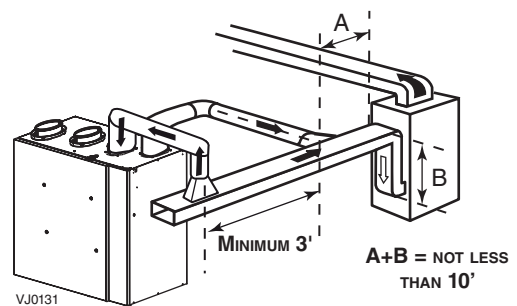
When performing duct connections to the furnace supply duct (Method 1), this duct must be sized to support the additional airflow produced by the unit. Also, the use of metal duct is highly recommended. For a Return-return installation, the furnace blower must be in operation when the unit is in operation.

There are 2 methods for connecting the unit to the furnace/air handler:

##### Method 1: Supply-return connection



##### Method 2: Return-return



##### Stale air intake

- Cut an opening into the furnace/air handler return duct not less than 10 feet from the furnace/air handler (A+B).
- Connect this opening to the **Exhaust air from building** port of the unit.

##### Fresh air distribution

- Same instructions as for Method 1 or Method 2, Section 3.5.2.

For Method 2 (Return-return), make sure there is a distance of at least 3 feet between the 2 connections to the furnace/air handler.

#### CAUTION

If using Method 2, make sure the furnace/air handler blower operation is synchronized with the unit operation! See Section 5.

NOTE: For Method 1, it is not essential to synchronize the furnace blower operation with the unit operation, but we recommend it.

### 3. INSTALLATION (CONT'D)

#### 3.6 CONNECTING THE DUCTS TO THE UNIT

**NOTE:** All unit ports are created to be connected to ducts having a minimum of 6" diameter, but if need be, they can be connected to bigger sized ducts by using an appropriate transition (e.g.: 6" diameter to 7" diameter transition).

##### Insulated flexible ducts

Use the following procedure to connect the insulated flexible ducts to the ports of the unit (**Exhaust air to outdoors** and **Fresh air from outdoors** ports).

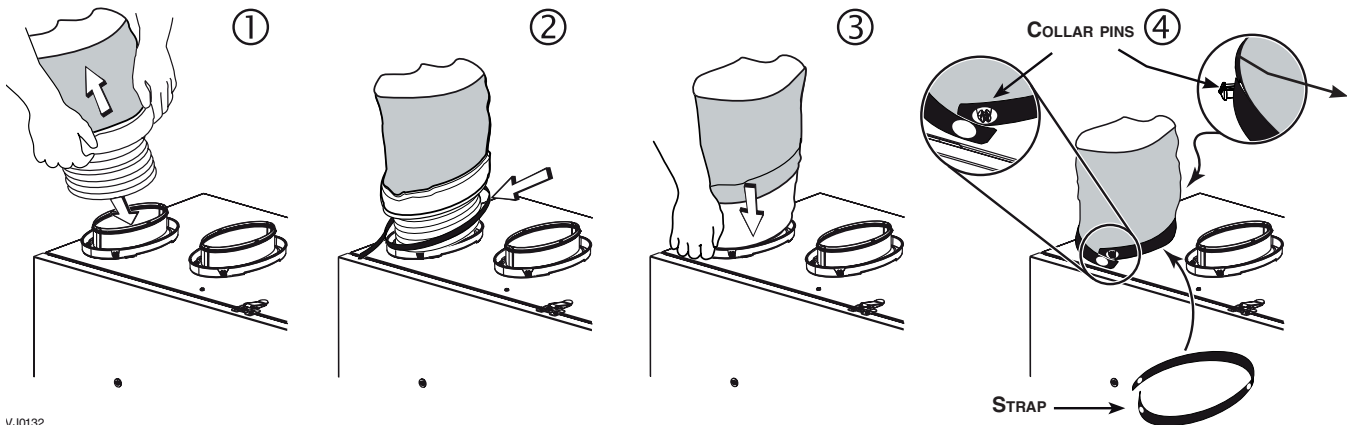
#### CAUTION

**If ducts have to go through an unconditioned space (e.g.: attic), always use insulated ducts.**

- ① Pull back the insulation to expose the flexible 6 in. round duct.
- ② Attach the flexible duct to the port using tie wrap.
- ③ Pull the insulation over the joint and tuck in between the inner and outer rings of the double collar without compressing it to minimize possible condensation buildup within the duct, as well as minimize building heat loss and gain.
- ④ Pull down the vapor barrier (shaded part in illustrations below) over the outer ring to cover it completely. Fasten in place the vapor barrier using the port strap (included in unit parts bag). To do so, insert one collar pin through vapor barrier and first strap hole, then insert the other collar pin through vapor barrier and center strap hole and close the loop by inserting the first collar pin in the last strap hole to create an air-tight path and to minimize building heat loss and gain and reduce the potential for condensation.

#### CAUTION

**Make sure the vapor barrier on the insulated ducts does not tear during installation to avoid condensation within the ducts.**

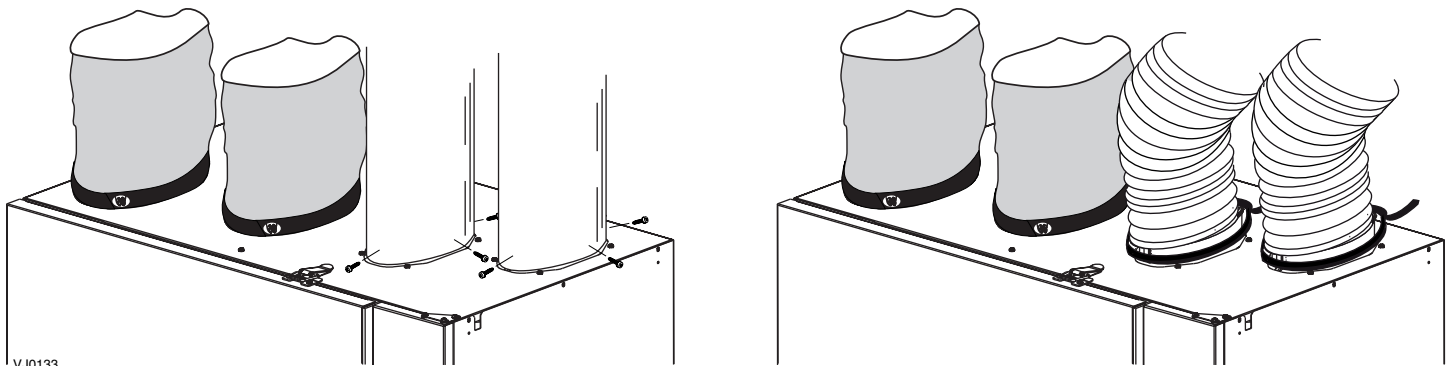


##### Non-insulated rigid ducts

Use metal screws and duct tape to connect the rigid ducts to the unit ports.

##### Non-insulated flexible ducts

Use tie wraps to connect the flexible ducts to the unit ports.



#### CAUTION

**Make sure to replace insulation around any openings made in the building envelope when installing unit or ducting. Seal insulation with tape or caulk to minimize building heat loss and gain and to reduce the potential for condensation.**

### 3. INSTALLATION (CONT'D)

#### 3.7 INSTALLING TWO EXTERIOR HOODS

##### ⚠ WARNING

Make sure intake hood is located at least 10 feet away from any of the following:

- Dryer exhaust, central vacuum vent
- Gas meter exhaust, gas barbecue-grill
- Any exhaust vents or chimney from a combustion source
- Garbage bin and any other source of contamination such as parking lots, streets

For multifamily buildings only:

Make sure exhaust hood is located at least 3 feet away from any of the following:

- Property lines
- Operable openings into buildings (door, window)
- Intake and exhaust hood(s) shall be protected with corrosion-resistant screens, louvers or grilles having openings not less than 1/4 inch and not larger than 1/2 inch.
- Install hood(s) at least at 18 inches away from the ground OR depth of expected snow accumulation, whichever is greater.

To minimize cross-contamination of exhausted stale air into the fresh air intake:

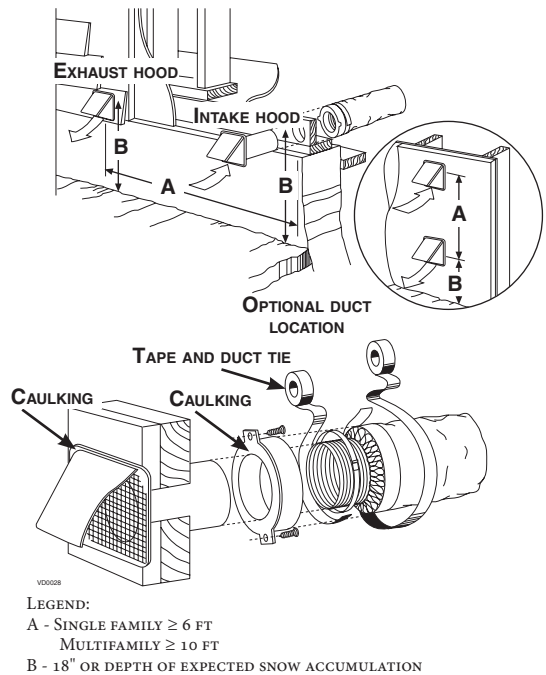
Single detached, attached homes and townhouses:

- Maintain a 6 feet minimum separation distance between outdoor air intake and exhaust hoods OR use an approved factory-built intake/exhaust combination termination fitting.

Multifamily buildings:

- Maintain a 10 feet minimum separation distance between outdoor air intake and exhaust hoods OR use an approved factory-built intake/exhaust combination termination fitting.

Ignoring these recommendations could significantly degrade the quality of the incoming air which, in some cases, could result in health consequences. In the event of a conflict between our recommendations and any local requirements, the latter shall have priority.

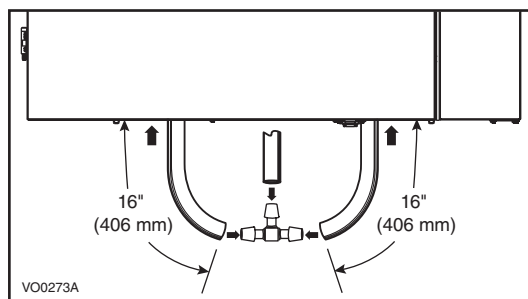


Refer to figure above for connecting insulated ducts to the exterior hoods. An "Anti-gust intake hood" should be installed in regions where a lot of snow is expected to fall.

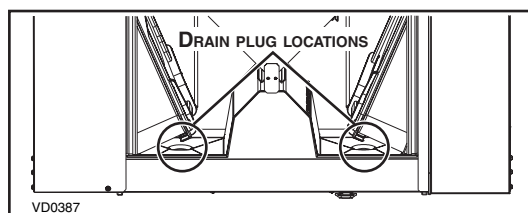
#### 3.8 CONNECTING THE DRAIN

##### CAUTION

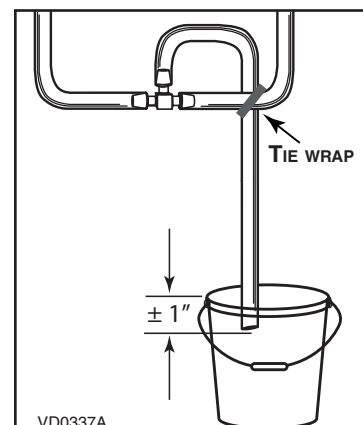
**A drain tubing (included) must be installed for all HRV units. For ERV units, it is not required, however, it is recommended for climates where the outdoor temperature typically remains below -13°F, (over a 24-hour period) for several days in a row, combined with an indoor humidity of 40% or higher.**



Cut 2 sections of the plastic tube, at least 16" long, and attach them to each inner drain fitting, located under the unit. Join both short sections to the "T" junction and main tube as shown.



NOTE: For ERV units installed in cold climate, remove both drain plugs inside the unit prior to install tubing.



Make a water trap loop in the tube to prevent the unit from drawing unpleasant odors from the drain source. Make sure this loop is located OVER the "T" as shown. Run the tube to the floor drain or to an alternative drain pipe or pail.

##### IMPORTANT

If using a pail to collect water, locate the tube end approximately 1" from the top of the pail in order to prevent water from being drawn back up into the unit.

## 4. CONTROLS

### 4.1 UNIT BOOTING SEQUENCE

The unit booting sequence is similar to a personal computer boot sequence. Each time the unit is plugged after being unplugged, or after a power failure, the unit will perform a 30-second booting sequence before starting to operate.

During the booting sequence, the unit is checking and resetting the motorized damper position.

Once the motorized damper position completely set, the booting sequence is done.

NOTE: No command will be taken until the unit is fully booted.

### 4.2 WALL CONTROL(S) ELECTRICAL CONNECTION

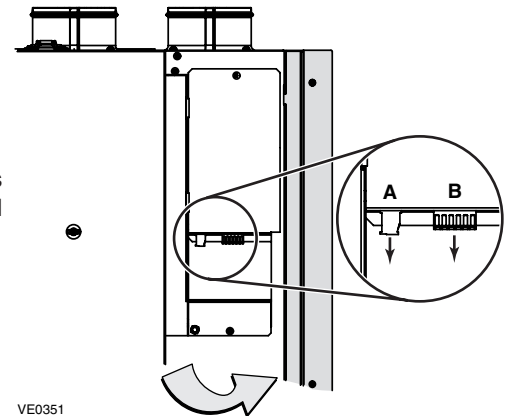
#### ⚠ WARNING

**The VT9W wall control is the only main wall control compatible to your unit. Never attempt to install another wall control model. Always disconnect the unit before making any connections. Failure to disconnect power could result in electric shock or damage to the wall control or electronic module inside the unit.**

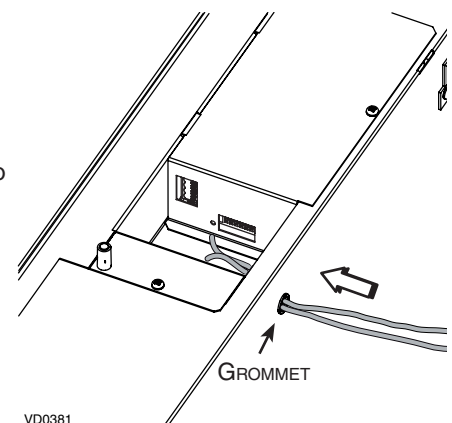
#### CAUTION

**Failure to comply with the following can cause erratic operation of the unit and/or the wall control: Never install more than one VT9W main wall control per unit. Make sure that the wires do not short-circuit between themselves or by touching any other components on the wall control. Avoid poor wiring connections. To reduce electrical interference (noise) potential, do not run wall control wiring next to control contactors or near light dimming circuits, electrical motors, dwelling/building power or lighting wiring, or power distribution panel.**

Unplug the unit from power source. Open the side panel to access terminal blocks (**A** is the one for main control connection only and **B** is the one for auxiliary controls). Pull out from the unit board the needed connector(s).



Run the end of the control wire(s) through the grommet located on the unit wall. Refer to illustration at right (side panel removed to ease understanding).



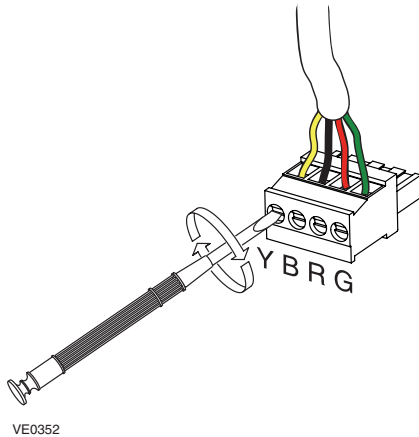
## 4. CONTROLS (CONT'D)

### 4.2 WALL CONTROL(S) ELECTRICAL CONNECTION (CONT'D)

#### 4.2.1 TERMINAL BLOCK(S) CONNECTION

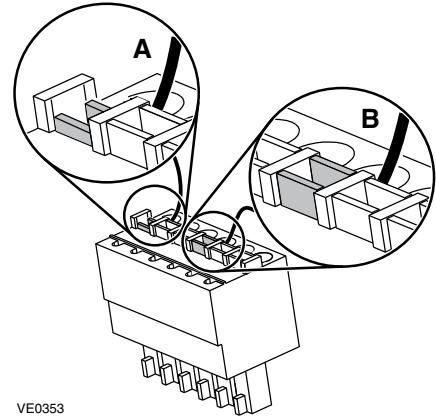
##### MAIN CONTROL TERMINAL BLOCK

Strip the end of the main control cable to access the 4 wires. Strip the end of each wire. Using a small flat blade screwdriver, connect each wire to its corresponding terminal, by referring on the sticker affixed on the unit: YELLOW wire to "Y," BLACK wire to "B," RED wire to "R" and GREEN wire to "G."



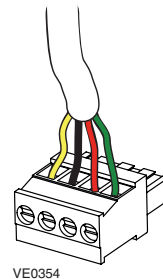
##### AUXILIARY CONTROL TERMINAL BLOCK

Strip the end of the auxiliary control cable to access the wires. Strip the end of 3 wires. Check if all wires are correctly inserted in their corresponding holes in the terminal block. (A wire is correctly inserted when its orange receptacle is lower than another one without wire. On illustration below, wire A is correctly inserted, but wire B is not.)

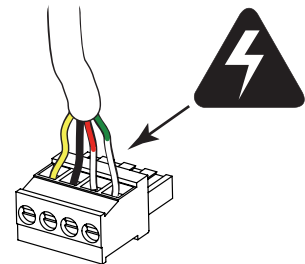


When stripping the wires, ensure to remove only the necessary length of sheath in order to prevent short circuits.

#### RIGHT

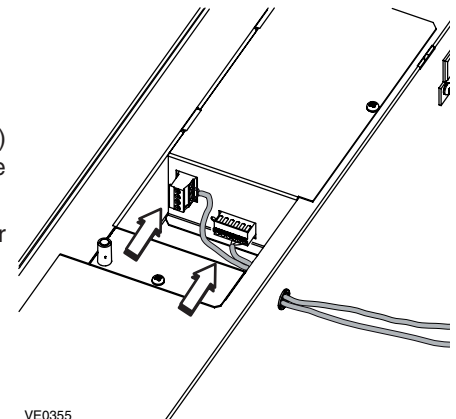


#### WRONG



Once the terminal block(s) connections have been made, reinstall it (them) on the unit PC board. Refer to illustration at right (side panel removed to ease understanding). Close the side panel.

NOTE: For information about the operation of the wall controls, refer to their installation sheet.

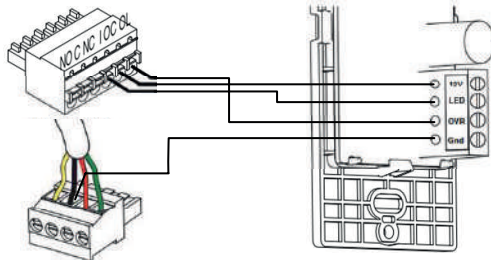


## 4. CONTROLS (CONT'D)

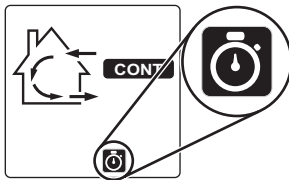
### 4.2 WALL CONTROL(S) ELECTRICAL CONNECTION (CONT'D)

#### 4.2.2 ELECTRICAL CONNECTION TO VBATHW OPTIONAL AUXILIARY CONTROL(S)

Up to five (5) VBATHW auxiliary controls can be installed.



NOTE: The auxiliary wall control can be used with a 3-wire connection by removing the LED signals. This optional wiring will not allow an installation with more than 1 auxiliary wall control to properly synchronize their LEDs on an event requested from a peer. Only the auxiliary wall control having requested the timer event will have the LEDs updated accordingly.



When used, the VBATHW activation will override the main control operation, as well as the unit defrost cycle. On example shown on the left, the unit was in CONT mode when the auxiliary control was activated; so the actual operation mode stays on VT9W main wall control screen, but the chronometer icon appears as long as the VBATHW is activated.

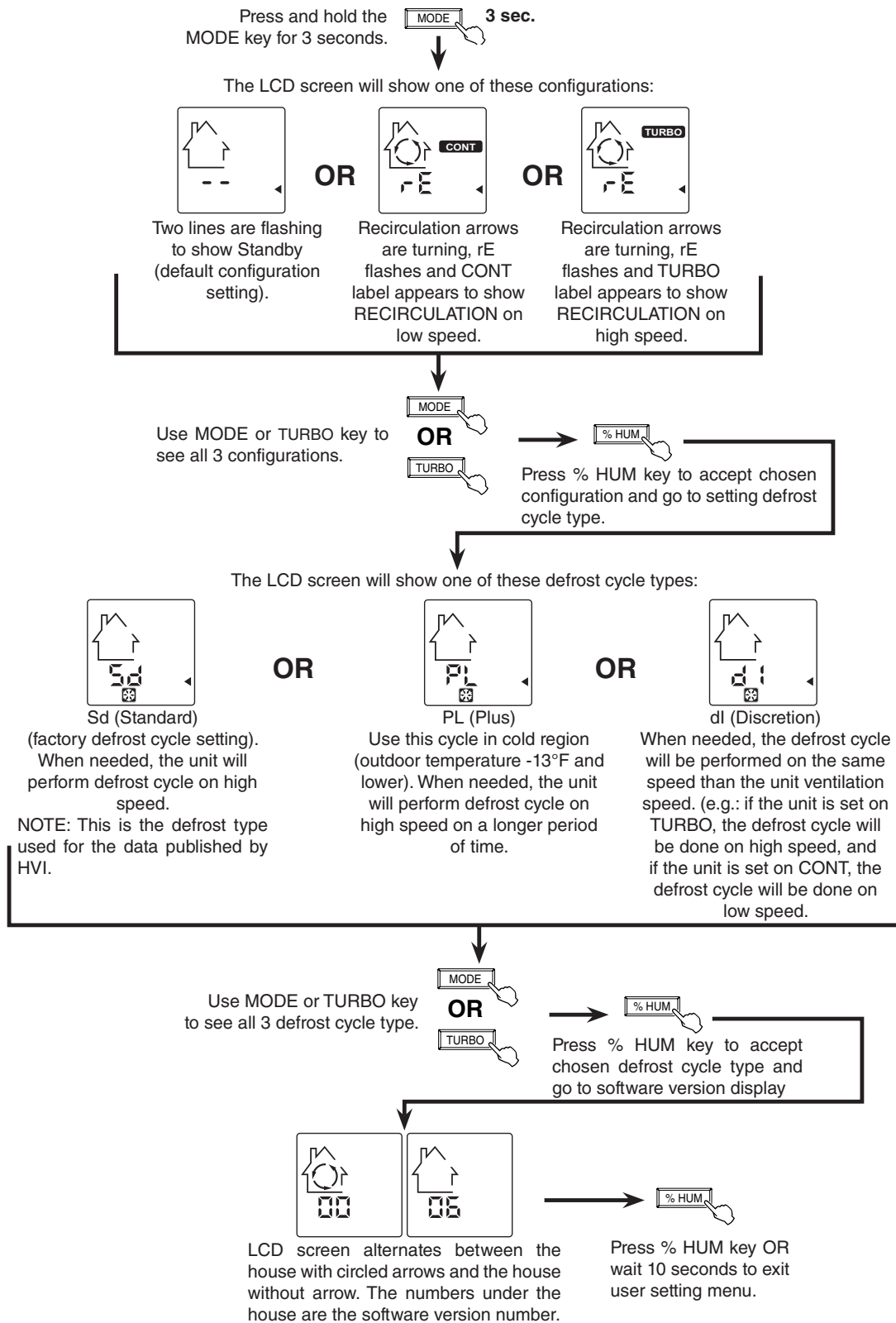
NOTE: In colder regions, the chronometer icon may stay after the end of the VBATHW cycle, due to defrost cycle.

## 4. CONTROLS (CONT'D)

### 4.3 SETTING UNIT OPERATION IN THE REMAINING 40 MINUTES ON 20 MIN/H MODE AND SETTING UNIT DEFROST CYCLE TYPE USING VT9W MAIN WALL CONTROL

#### CAUTION

**Set extended defrost on all units located in climates where the outdoor temperature typically remains below -13°F (i.e. Bemidji, MN; Duluth, MN; Fargo, ND; Fairbanks, AK) over a 24-hour period for several days in a row, combined with an indoor humidity of 40% or higher.**





## 5. ELECTRICAL CONNECTION TO THE FURNACE

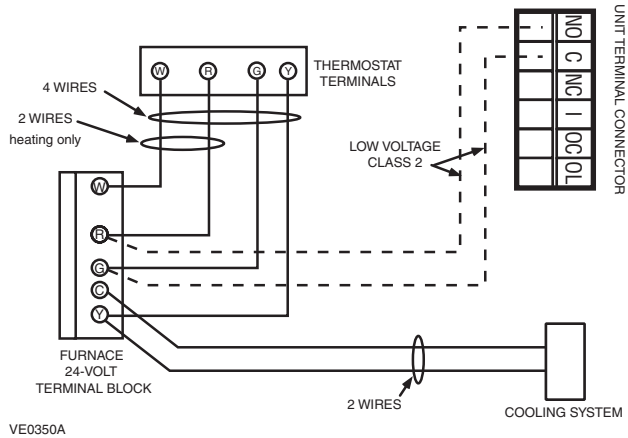
### ⚠ WARNING

Never connect a 120-volt AC circuit to the terminals of the furnace interlock (standard wiring). Only use the low voltage class 2 circuit of the furnace blower control.

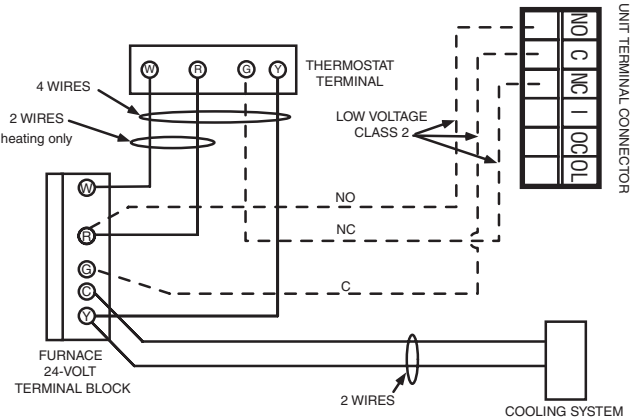
#### For a furnace connected to a cooling system:

On some older thermostats, energizing the “R” and “G” terminals at the furnace has the effect of energizing “Y” at the thermostat and thereby turning on the cooling system. If you identify this type of thermostat, you must use the ALTERNATE FURNACE INTERLOCK WIRING.

STANDARD FURNACE INTERLOCK WIRING



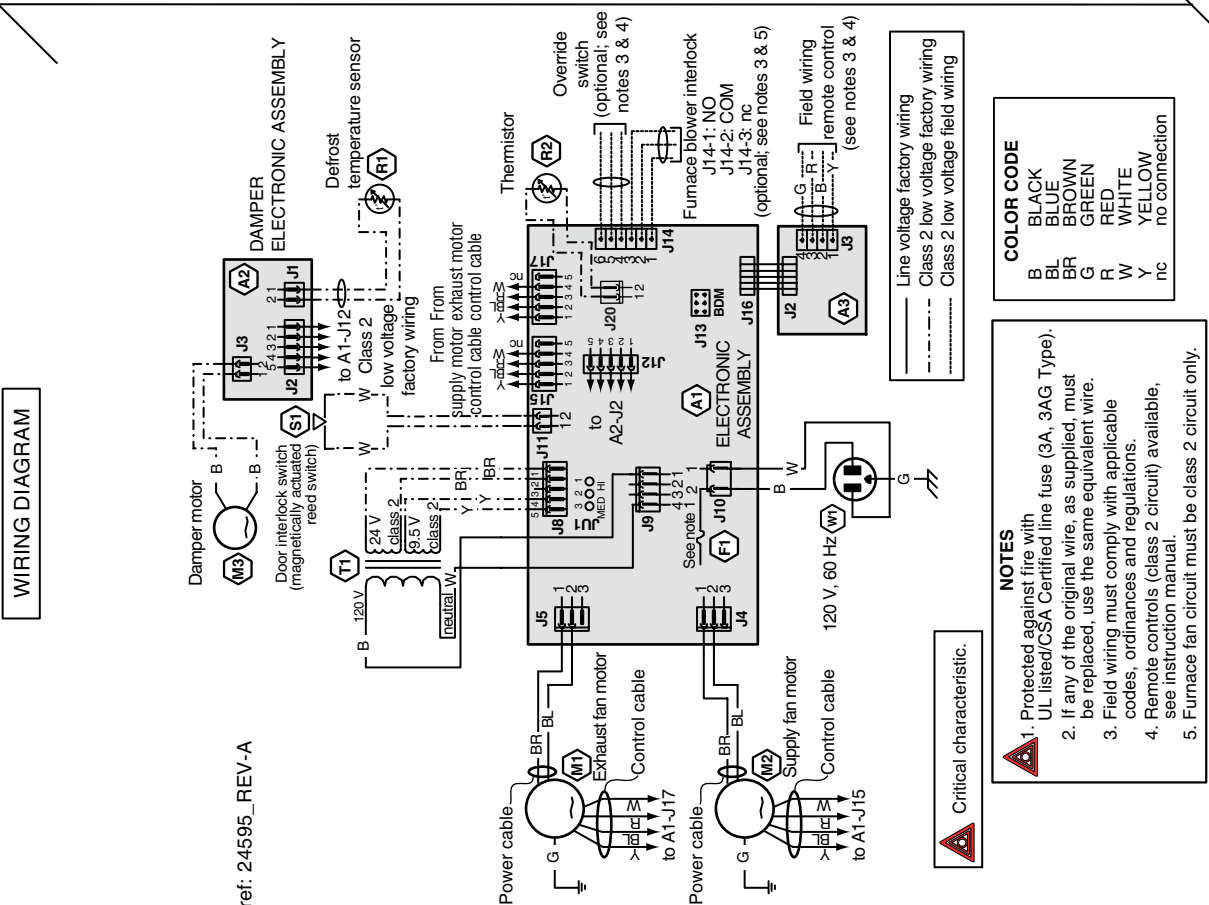
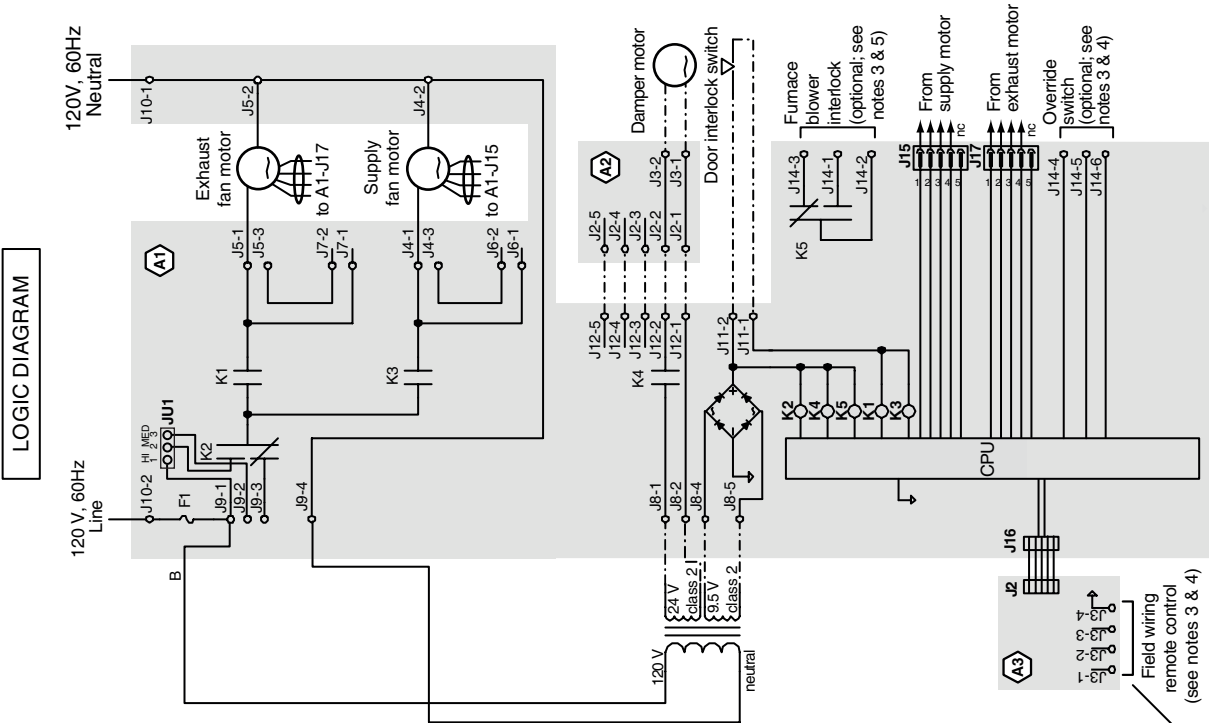
ALTERNATE FURNACE INTERLOCK WIRING



## 6. WIRING DIAGRAM

### ⚠ WARNING

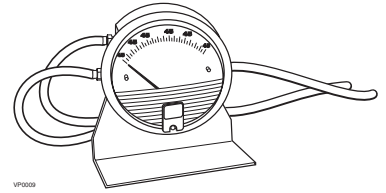
- Risk of electric shocks. Before performing any maintenance or servicing, always disconnect the unit from its power source.
- This product is equipped with an overload protection (fuse). A blown fuse indicates an overload or a short-circuit situation. If the fuse blows, unplug the product from the outlet. Discontinue using the unit and contact technical support.



## 7. BALANCING THE UNIT

### 7.1 WHAT YOU NEED TO BALANCE THE UNIT

- One VT9W main wall control close to the unit.
- A magnehelic gauge capable of measuring 0 to 0.5 inch of water (0 to 125 Pa) and 2 plastic tubes.
- The balancing chart of the unit.



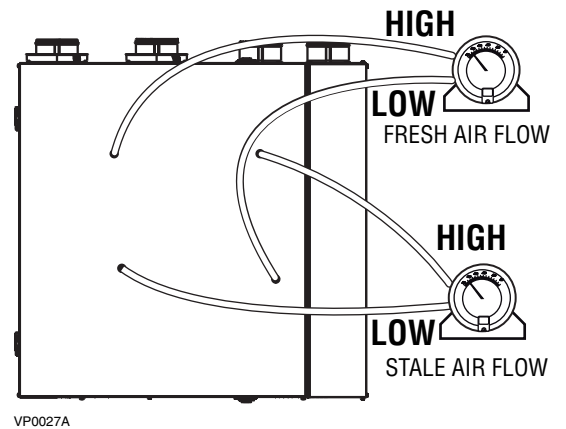
### 7.2 PRELIMINARY STAGES TO BALANCE THE UNIT

- Seal all the unit ductwork with tape. Close all windows and doors.
- Turn off all exhaust devices such as range hood, dryer and bathroom fans.
- Make sure all filters are clean (if it is not the first time the unit is balanced).

NOTE: Make sure that the furnace/air handler blower is ON if the installation is in any way connected to the ductwork of the cold air return. If not, leave furnace/air handler blower OFF.

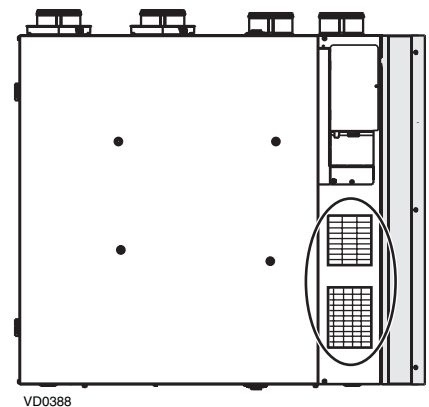
### 7.3 USING MAGNEHELIC GAUGES

1. Place the magnehelic gauge on a level surface and adjust it to zero.
2. According to the airflow to be measured, connect tubing from gauge to STALE air flow or FRESH air flow pressure taps (see illustration at right).  
Be sure to connect the tubes to their appropriate *high/low* fittings. If the gauge drops below zero, reverse the tubing connections.



### 7.4 BALANCING CHART AND PRESET SPEEDS TABLE

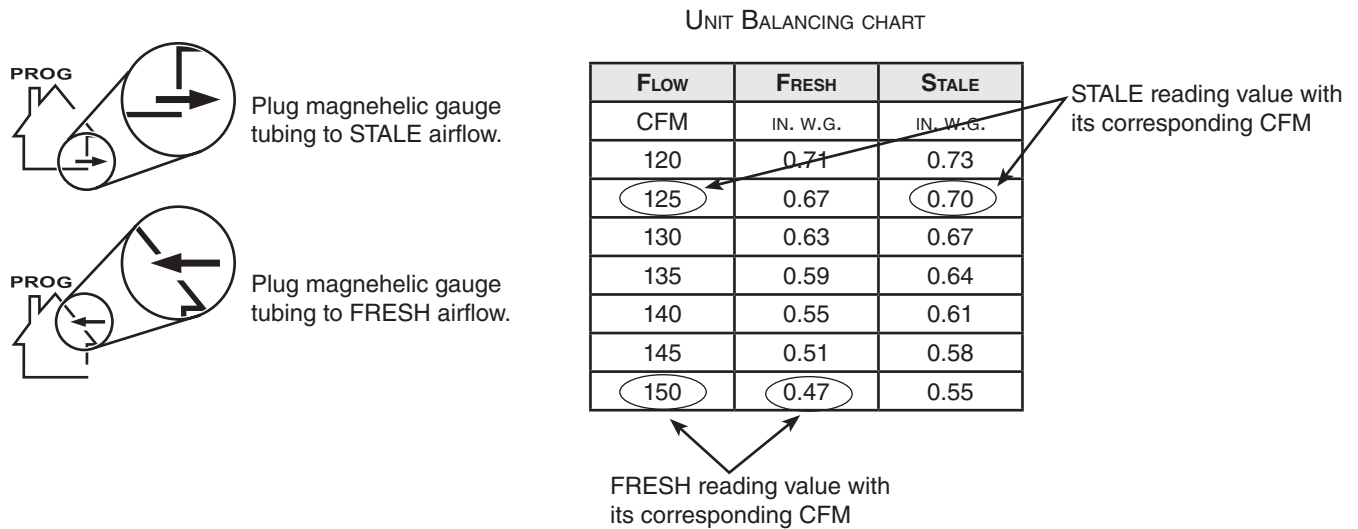
The unit balancing chart and the unit preset speed table are affixed on the unit, behind the right panel (circled area on illustration at right).



## 7. BALANCING THE UNIT (CONT'D)

### 7.4 BALANCING CHART AND PRESET SPEEDS TABLE (CONT'D)

Use the balancing chart to convert pressure (in. w.g.) values read from magnehelic gauge to airflow (CFM) values. While balancing, the VT9W wall control screen shows which pressure taps have to be used. See example below.




NOTE: The unit is considered balanced even if there is a difference of  $\pm 10$  CFM (or  $\pm 5$  L/s or  $17 \text{ m}^3/\text{h}$ ) between the two airflows.

The special design of these units, combined with the VT9W main wall control, offer many preset speeds ranges according to the unit models.

See preset speeds table example below.

**PRESET SPEEDS TABLE**




UNIT MODEL				
PRESET SPEEDS NO.	<b>TURBO</b> HIGH SPEED (CFM @ 0.4 IN. W.G.)	<b>CONT</b> LOW SPEED (CFM @ 0.2 IN. W.G.)	 20/40/60 MIN. CONTROL STALE AIR (CFM @ 0.4 IN. W.G.)	<b>RECIRC</b> RECIRCULATION SPEED (CFM @ 0.4 IN. W.G.)
--	From 60 to 250	From 30 CFM to 75% of adjusted TURBO speed	From 60 to 250	From 60 to 250
01	250	125	250	250
02	225	110	250	225
03	200	100	250	200
04	175	85	225	175
05	150	75	200	150
06	125	60	175	125
07	100	50	150	100
08	This speed must be used for HVI testing at 64 CFM @ 13°F (-25°C)			
09	This speed must be used for HVI testing at 98 CFM @ 13°F (-25°C)			

## 7. BALANCING THE UNIT (CONT'D)

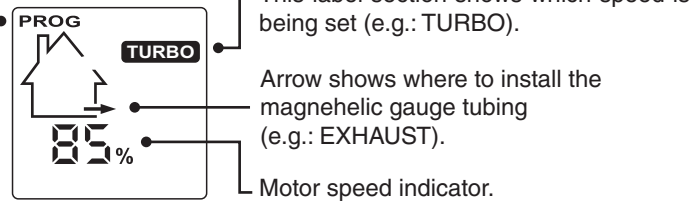
### 7.5 BALANCING PROCEDURE

#### ① Connect an VT9W main wall control nearby the unit.

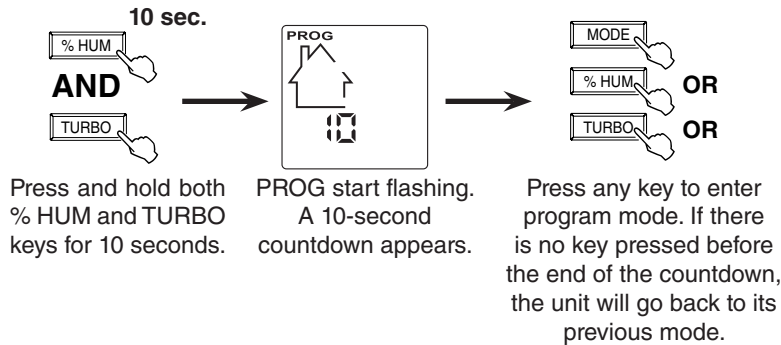
##### GENERAL INFORMATION ABOUT VT9W WALL CONTROL USAGE IN UNIT BALANCING PROCEDURE

-  Press on MODE key to raise the value.
-  Press on % HUM key to accept.
-  Press on TURBO key to lower the value.

PROG flashes on screen as long as you are in Program Mode Setting menus (preset speeds or custom speeds). It disappears from screen when all settings are done or when there is no change after 60 seconds.



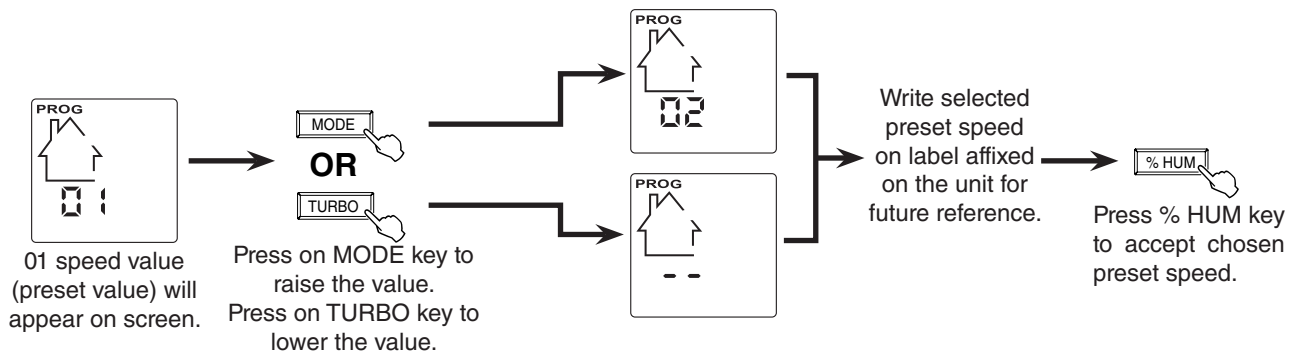
#### ② Enter Program Mode.



Choose between two options: • 01, 02, etc.: Preset speeds (balance the unit only, faster option)

- - -: Custom speeds (adjust TURBO speed and balance the unit, then set CONT, VBATHW control and RECIRC speeds).

#### ③ Select the Preset speeds or Custom speeds.



NOTE: From 01 value, pressing on TURBO key will access to custom speed settings (see page 23).

#### ④ Connect the magnehelic tubings to the unit (see 7.3).

## 7. BALANCING THE UNIT (CONT'D)

### 7.5 BALANCING PROCEDURE (CONT'D)

- ⑤ If the unit speed is set close to its highest speed, we recommend to first measure and note both airflows.
- ⑥ Refer to the unit balancing chart to find the corresponding CFMs.
- ⑦ Determine which airflow should be adjusted (the higher airflow must be lowered to equalize the lower one).  
See example below.

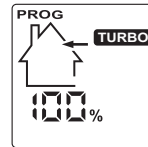
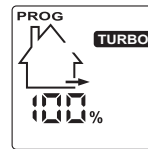
Pressure in. w.g.	Fresh CFM	Stale CFM
0.31	152	155
0.32	156	159
0.33	159	162
0.34	162	166
0.35	165	169
0.36	168	172
0.37	171	176
0.38	174	179
0.39	177	183
0.40	180	186
0.41	183	189
0.42	186	193
0.43	189	196
0.44	193	200
0.45	196	203
0.46	199	206
0.47	202	210
0.48	205	213
0.49	208	217
0.50	211	220
0.51	214	223
0.52	217	227
0.53	220	230
0.54	223	234
0.55	226	237

NOTE: At first airflow readings, for speed value 01, both stale and fresh airflow values displayed on control screen are 100%.

#### Before airflow adjustment

STALE airflow  
reading:  
0.41 in. w.g.,  
189 CFM

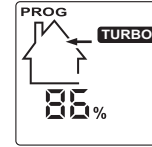
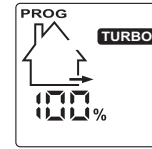
FRESH airflow  
reading:  
0.50 in. w.g.,  
211 CFM



#### After airflow adjustment

STALE airflow  
reading:  
0.41 in. w.g.,  
189 CFM

FRESH airflow  
reading:  
0.43 in. w.g.,  
189 CFM



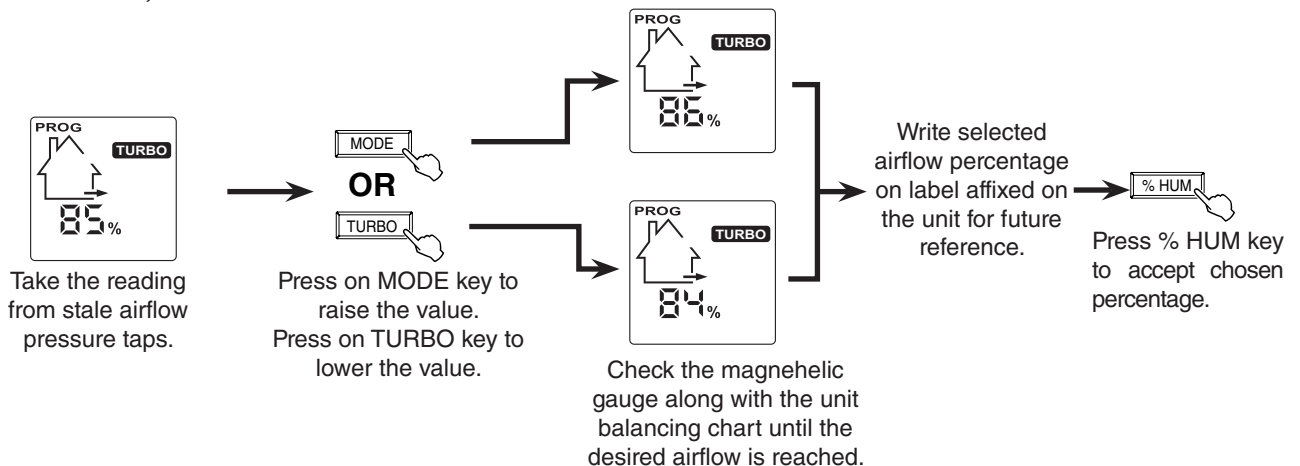
In that case, the FRESH  
airflow must be lowered  
to reach the STALE  
airflow value.

STALE reading  
value with its  
corresponding  
CFM

FRESH reading  
value with its  
corresponding  
CFM

- ⑧ Adjust stale air TURBO speed (or press % HUM key to keep it as is).

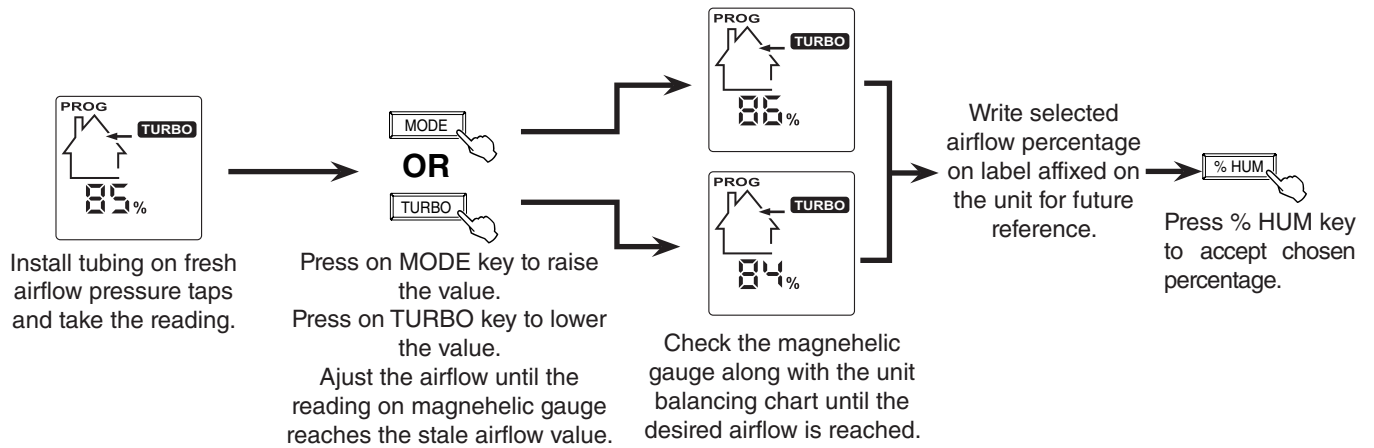
NOTE: The following shown values are example. The real values vary according to the preset speed chosen, the unit installation, etc.



## 7. BALANCING THE UNIT (CONT'D)

### 7.5 BALANCING PROCEDURE (CONT'D)

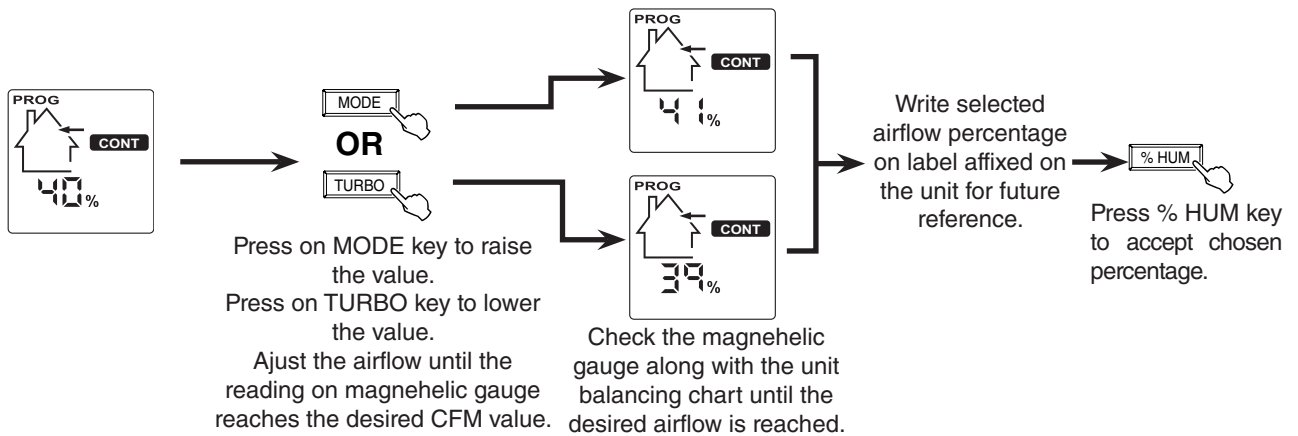
- ⑨ Adjust fresh air TURBO speed (or press % HUM key to keep it as is).



If you have selected the preset speed balancing at ⑦, the balancing procedure is completed.

If you have selected the custom speed balancing, continue with the following:

- ⑩ Set CONT speed.

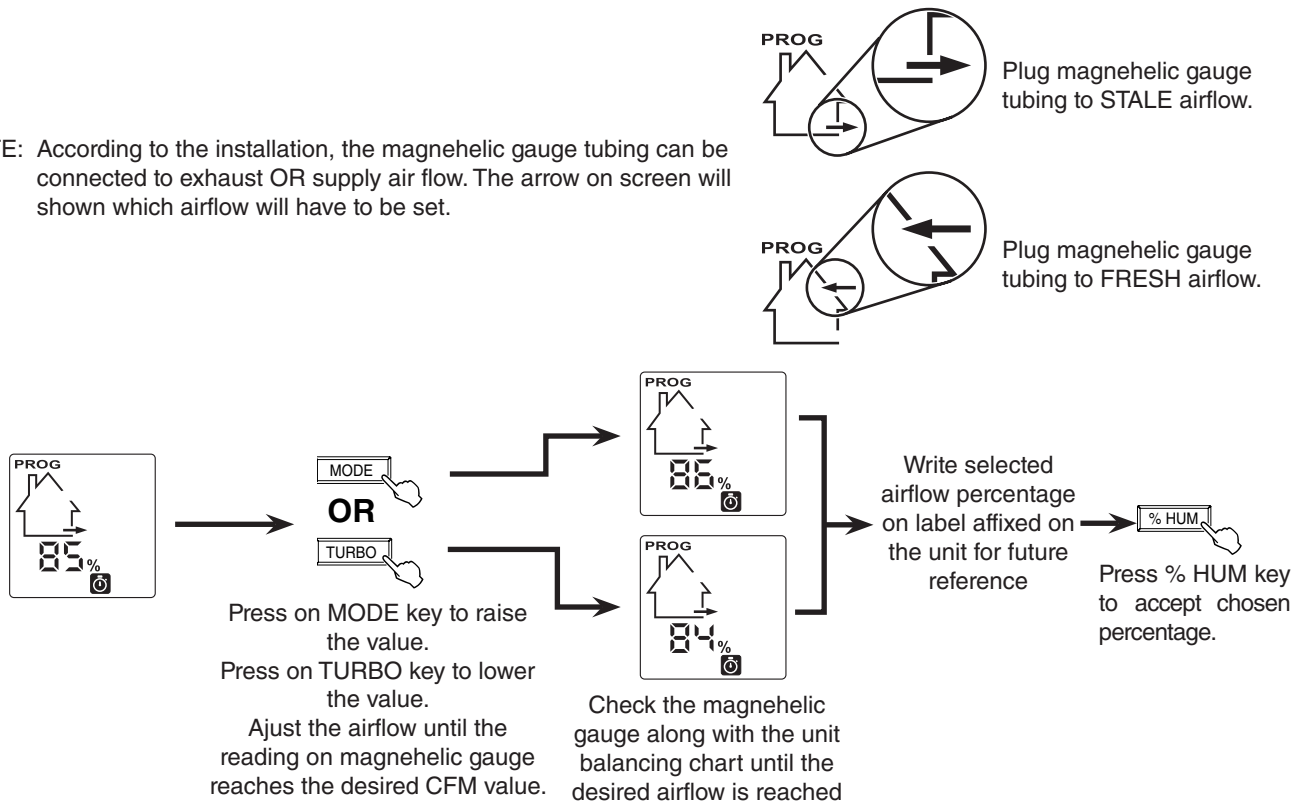


## 7. BALANCING THE UNIT (CONT'D)

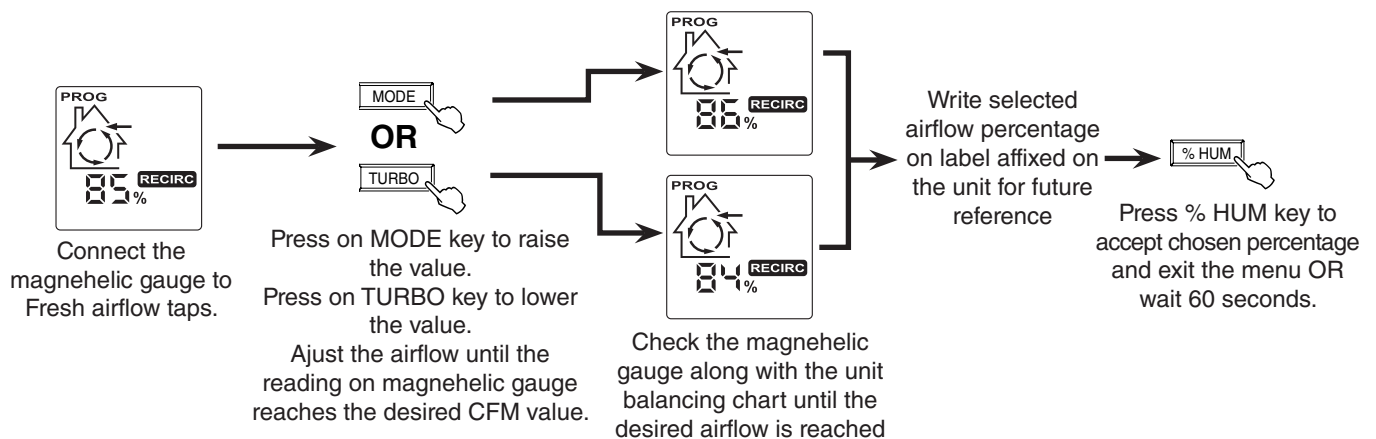
### 7.5 BALANCING PROCEDURE (CONT'D)

#### ⑪ Set VBATHW control speed.

NOTE: According to the installation, the magnehelic gauge tubing can be connected to exhaust OR supply air flow. The arrow on screen will shown which airflow will have to be set.



#### ⑫ Set RECIRC speed.



The balancing procedure is completed.

NOTE: The adjusted airflow values are stored within the unit, so, if needed, any VT9W main control can be used to adjust the unit speeds and balance the unit again. If a power failure occurs, the unit will keep these setting values. To change the setting values, go to step ⑥ and follow the procedure, the new values will replace the previous ones.




## 8. TROUBLESHOOTING

### ⚠ WARNING

**Risk of electric shocks. Electronic board connections must be checked by qualified personnel only.**

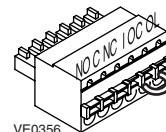
If the unit does not work properly, reset the unit by unplugging and then replug it. If it is still not working properly, refer to the table below.

If the LED of the unit is flashing, this means the unit sensors have detected a problem. See the table below to know where the problem occurs on the unit.

LED SIGNAL ON UNIT	ERROR CODE ON CONTROL SCREEN	ERROR TYPE	ACTION	UNIT STATUS
LED flashes GREEN (double blink every 2 seconds).	E21	Cold side thermistor error.	<ul style="list-style-type: none"> <li>Ensure J12 connector is properly connected and its wires are not damaged. If they are correct:</li> <li>Replace the damper system assembly.</li> </ul>	Unit works but will defrost frequently.
LED flashes GREEN (2 blinks per second; faster blink).	E22	Warm side thermistor error.	<ul style="list-style-type: none"> <li>Ensure J20 connector is properly connected and its wires are not damaged. If they are correct:</li> <li>Replace the warm side thermistor.</li> </ul>	Unit does not work.
LED flashes AMBER.	E23	Damper system error.	<ul style="list-style-type: none"> <li>Go to point 6 in next table.</li> </ul>	Unit does not work.
LED flashes RED (one blink every 2 seconds).	E25 and E26 alternately	Open door while the unit is in function or magnetic switch bad contact.	<ul style="list-style-type: none"> <li>Reset the VT9W wall control by pressing on MODE and %HUM keys for 10 seconds.</li> <li>Check if the unit door is properly closed and for the door magnet to be properly seated onto the door. If not, correct the situation, close the door and reset the VT9W wall control by pressing on MODE and %HUM keys for 10 seconds.</li> <li>Ensure J11 connector is properly connected and its wires are not damaged. If not, correct the situation, close the door and reset the VT9W wall control by pressing on MODE and %HUM keys for 10 seconds.</li> <li>Using a flat blade screwdriver, jump J11, reset the VT9W wall control by pressing on MODE and %HUM keys for 10 seconds and set the unit on CONT.</li> </ul> <p>If the LED is still flashing, go to point 8 in next table for motor diagnosis.</p>	Unit does not work.
	E25	Supply motor error.	<ul style="list-style-type: none"> <li>Go to point 8 in next table.</li> </ul>	
	E26	Exhaust motor error.	<ul style="list-style-type: none"> <li>Go to point 8 in next table.</li> </ul>	
LED flashes RED (2 blinks per second; faster blink).		Unit is on protection mode.	<ul style="list-style-type: none"> <li>If outside temperature is colder than -25°C, it could be normal for the unit to enter in protection mode. There is no action to be taken.</li> <li>If the snowflake icon appears frequently, the airflows of the unit may be not balanced or the damper system may be damaged. See point 7 in next table.</li> </ul>	Unit perform a special defrost and go back to its previous mode when completed.

## 8. TROUBLESHOOTING (CONT'D)

	PROBLEMS	POSSIBLE CAUSES	YOU SHOULD TRY THIS
1	The error code E01 is displayed on VT9W wall control screen.	<ul style="list-style-type: none"> <li>The wires may be in reverse position.</li> <li>The wires may be misconnected.</li> <li>The wires may be broken.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the color coded wires have been connected to their appropriate places.</li> <li>Ensure the wires are correctly connected.</li> <li>Inspect every wire and replace any damaged ones. If wires are hidden into walls, test the control using a shorter wire.</li> </ul>
2	The VT9W wall control screen alternates between normal display and E03.	<ul style="list-style-type: none"> <li>The VT9W wall control may be defective.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the VT9W wall control.</li> </ul>
3	The VT9W wall control does not work.	<ul style="list-style-type: none"> <li>Wrong main control.</li> <li>The wires may be in reverse position.</li> <li>The wires may be misconnected.</li> <li>The wires may be broke.</li> <li>Defective wall control.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure the main control is an VT9W.</li> <li>Ensure that the color coded wires have been connected to their appropriate places.</li> <li>Ensure the wires are correctly connected.</li> <li>Inspect every wire and replace any damaged ones. If wires are hidden into walls, test the control using a shorter wire.</li> <li>Replace the wall control.</li> </ul>
4	Unit does not work.	<ul style="list-style-type: none"> <li>Unit is unplugged.</li> <li>No power to power outlet.</li> <li>The fuse may be defective.</li> <li>J10, J9, or J8 connector(s) may be unplugged.</li> <li>The transformer may be defective (no 9.5 VAC between J8-4 and J8-5).</li> <li>The main PCB may be defective.</li> </ul>	<ul style="list-style-type: none"> <li>Make sure the unit is plugged.</li> <li>Test the power outlet with another electrical device (e.g.: a lamp). If it does not work, call an electrician.</li> <li>Unplug the product from the outlet. Check if fuse F1 (located on the PCB) is blown. In that case, discontinue using the unit and contact technical support.</li> <li>Check the connection of J10, J9, and J8 connectors.</li> <li>With unit powered on and J9 connected, check if there is about 9.5 VAC between J8-4 and J8-5 (YELLOW wires) transformer connector. If not, change the transformer.</li> <li>Replace the main PCB.</li> </ul>
5	The VBATHW push-button timer does not work (unit LED lit, no matter the color).	<ul style="list-style-type: none"> <li>The wires may be in reverse position.</li> <li>The wires may be misconnected.</li> <li>The wires may be broken.</li> <li>The push button may be defective.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the color coded wires have been connected to their appropriate places.</li> <li>Ensure the wires are correctly connected.</li> <li>Inspect every wire and replace any damaged ones. If wires are hidden into walls, test the control using a shorter wire.</li> <li>Jump the <b>OL</b> and <b>OC</b> terminals. If the unit switches to high speed, remove the push button and test it right beside the unit using another shorter wire. If it works here, change the wire. If it doesn't, change the push button.</li> </ul>
6	Unit is always on high speed.	<ul style="list-style-type: none"> <li>The VBATHW push-button timer wires may be shorted.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure <b>OC</b> and <b>OL</b> wires do not touch each others.</li> <li>Unplug wires from the auxiliary control terminal block and measure the resistance between cables (there should be no resistance). If resistance has been detected, ensure the wires are correctly connected, then inspect every wire and replace damaged ones.</li> </ul>



## 8. TROUBLESHOOTING (CONT'D)

	PROBLEMS	POSSIBLE CAUSES	YOU SHOULD TRY THIS
7	The damper system does not work (LED flashes AMBER, error code E23).	<b>At power up, no RED LED.</b>	<ul style="list-style-type: none"> <li>• See point 4.</li> </ul>
		<b>At power up, LED lights RED and there is a clicking sound coming from electrical compartment, but damper does not move:</b> <ul style="list-style-type: none"> <li>• Ice or other things hindering the damper movement.</li> <li>• J12 unconnected or bad contact.</li> <li>• Wrong connection of J8.</li> <li>• The transformer may be defective (no 24 VAC between J8-1 and J8-2).</li> </ul>	<ul style="list-style-type: none"> <li>• Remove ice or hindering elements.</li> <li>• Check J12 connection (both harness side and board side).</li> <li>• Check J8 connection.</li> <li>• With unit powered and J9 connected, check if there is about 20-24 VAC between J8-1 and J8-2 (BROWN wires) transformer connector. If no, change the transformer.</li> <li>• Erase the error code by pressing on MODE and %HUM keys for 10 sec., then set the unit in CONT and check if the error code is displayed again.</li> <li>• If the error code is back, replace the damper system.</li> </ul>
		<ul style="list-style-type: none"> <li>• The damper actuator may be defective.</li> </ul> <b>Damper moves but does not stop when supposed to:</b> <ul style="list-style-type: none"> <li>• Bad connection of J12 connector.</li> <li>• Damper system PCB defective or damper motor stripped gear.</li> <li>• The main PCB is defective.</li> </ul>	<ul style="list-style-type: none"> <li>• Check J12 connection (both harness side and board side).</li> <li>• Replace the damper system.</li> <li>• Replace the main PCB.</li> </ul>
8	A. The supply motor does not work, but exhaust motor works. (LED flashes RED, error code E25)	<ul style="list-style-type: none"> <li>• The supply motor may be defective or blocked by an obstacle.</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure that there is no obstacle blocking the motor.</li> <li>• Check the connection of J4 and J15 connectors.</li> <li>• Jump the <b>OL</b> and <b>OC</b> terminals and plug supply motor to J5 connector and exhaust motor to J4 connector. If the supply motor works but the exhaust motor does not, replace the main PCB. If the supply motor is still not working, plug back supply motor to J4 connector and exhaust motor to J5 connector and continue to investigate.</li> <li>• Swap both motor control cable connections on PCB: connect supply control cable to J17 connector and exhaust control cable to J15 connector. If the supply motor works but the exhaust motor does not, replace the main PCB. If the supply motor is still not working, plug back the exhaust control cable to J17 connector and replace the supply motor.</li> </ul>
	B. The exhaust motor does not work, but supply motor works. (LED flashes RED, error code E26)	<ul style="list-style-type: none"> <li>• The exhaust motor may be defective or blocked by ice or an obstacle..</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure that there is no obstacle or ice blocking the motor.</li> <li>• Check the connection of J5 and J17 connectors.</li> <li>• Jump the <b>OL</b> and <b>OC</b> terminals and plug exhaust motor to J4 connector and supply motor to J5 connector. If the exhaust motor works but the supply motor does not, replace the main PCB. If the exhaust motor is still not working, plug back exhaust motor to J5 connector and supply motor to J4 connector and continue to investigate.</li> <li>• Swap both motor control cable connections on PCB: connect exhaust control cable to J15 connector and supply control cable to J17 connector. If the exhaust motor works but the supply motor does not, replace the main PCB. If the exhaust motor is still not working, plug back the supply control cable to J15 connector and replace the exhaust motor.</li> </ul>
9	Unit works on CONT and TURBO modes, but not in RECIRC mode.	<ul style="list-style-type: none"> <li>• Reversed motor connections.</li> </ul>	<ul style="list-style-type: none"> <li>• Swap both motor power cable connections J4 and J5 on PCB. Check for the supply motor (on right side of the unit) operation in RECIRC mode.</li> <li>• If the exhaust motor is still running in RECIRC mode instead of supply, connect back in place power cable connections J4 and J5 on PCB and swap control cables J15 and J17 on PCB.</li> <li>• If the problem is not solved, change the PCB.</li> </ul>

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.