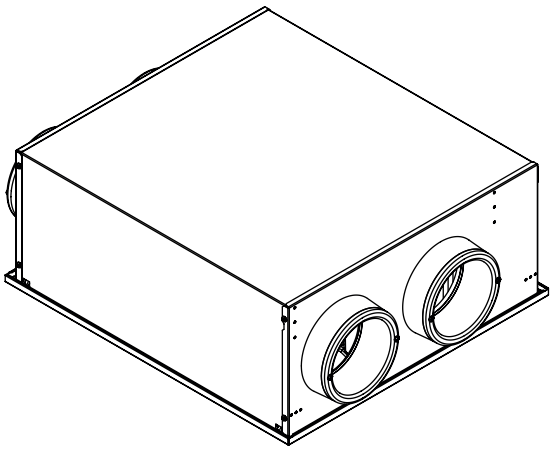
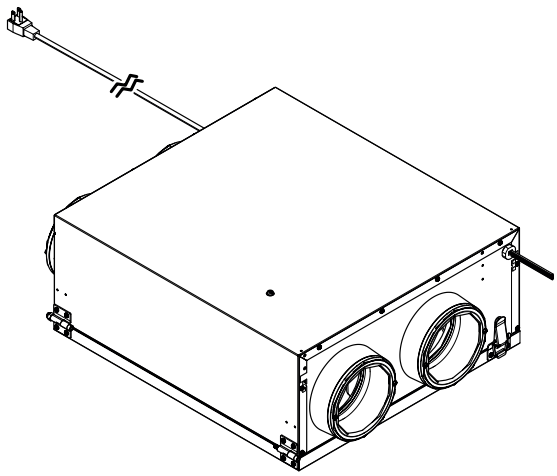
INSTALLATION AND USER GUIDE FOR BROAN ERVS100S-HW, ERVS100S-HW-M AND ERVS100S-PC



ERVS100S-HW
ERVS100S-HW-M



ERVS100S-PC

⚠ RESIDENTIAL USE ONLY ⚠

READ AND SAVE THESE INSTRUCTIONS
INSTALLER: LEAVE THIS MANUAL WITH HOMEOWNER

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin, USA Broan-NuTone.com 800-558-1711
Venmar Ventilation ULC, 550 Lemire Blvd., Drummondville, Québec, Canada J2C 7W9 Broan-NuTone.ca 800-567-3855

REGISTER YOUR PRODUCT ONLINE AT: www.broan-nutone.com/register

For additional information - visit www.broan-nutone.com (USA) or www.broan-nutone.ca (Canada)

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22077 rev. P

ABOUT THIS MANUAL

Please take note that this manual 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

Identifies 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. Before servicing or cleaning the unit, disconnect the power cord from electrical outlet or turn power off at the service panel.
3. This unit is not designed to provide combustion and/or dilution air for fuel-burning appliances.
4. When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.
5. Do not use this unit with any solid-state speed control device other than following controls:

Auxiliary controls energized by unit
Broan VB20W 20-minute lighted push-button timer
Standard dry contact

6. This unit must be grounded. **For the ERVS100S-PC unit only:** 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.
7. Do not install in a cooking area or connect directly to any appliances.
8. Do not use to exhaust hazardous or explosive materials and vapors.
9. This unit must be protected from the elements.
10. When performing installation, servicing or cleaning these units, it is recommended to wear safety glasses and gloves.
11. When applicable local regulation comprises 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 expense.

CAUTION

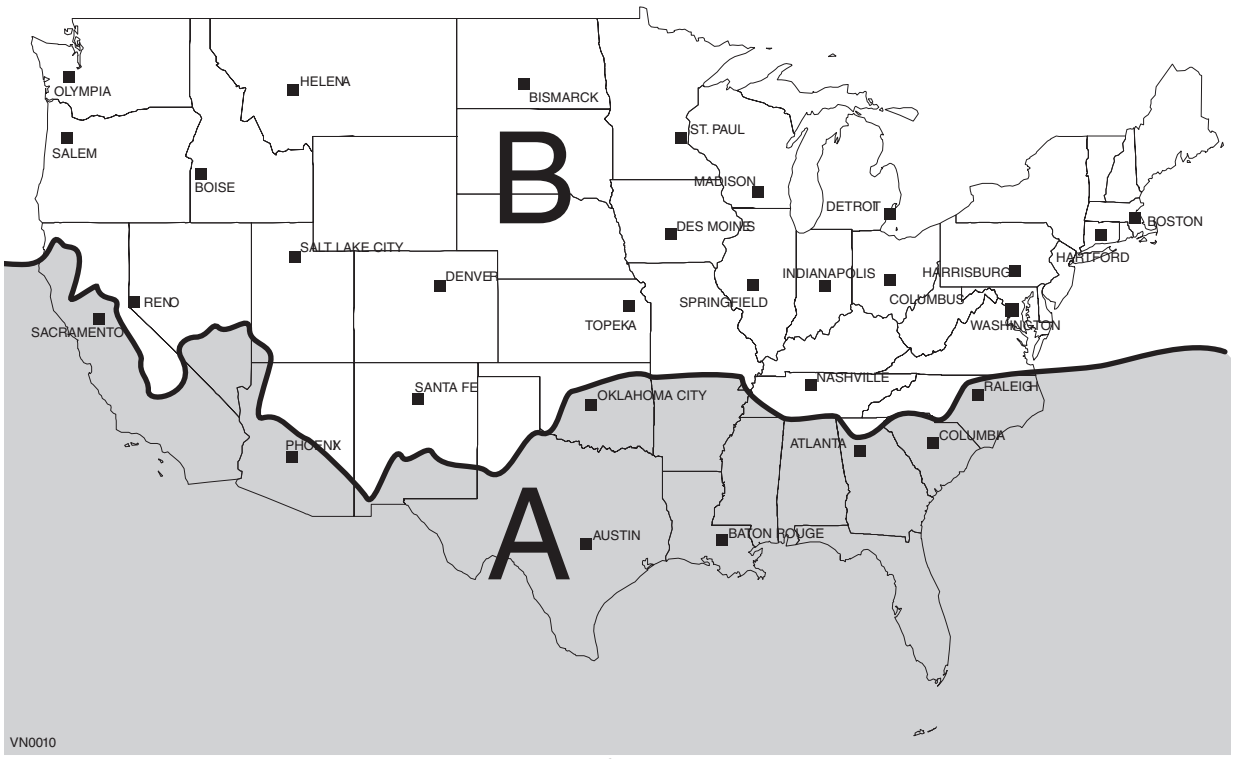
1. Do not use your unit during construction or renovation of your house or when sanding drywall. Certain types of dust and vapors may damage your system.
2. Please read specification label on product for further information and requirements.
3. Be sure to duct air outside – Do not intake/exhaust air into spaces within walls or ceiling or into attics, crawl spaces, or garage. Do not attempt to recover the exhaust air from a dryer or a range hood.
4. Intended for residential installation only in accordance with the requirements of NFPA 90B (for a unit installed in U.S.A.), or Part 9 of the National Building Code of Canada (for a unit installed in Canada).
5. Do not run any air ducts directly above or within 2 ft of a furnace or its supply plenum, boiler, or other heat producing appliance.
6. The ductwork is intended to be installed in compliance with all applicable local and national 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 unit must operate continuously except when performing maintenance and/or repair. Also, the ambient temperature of the house should never drop below 65°F (18°C).
9. At least once a year, the unit mechanical and electronic parts should be inspected by qualified service personnel.
10. Make sure at all times that the outside intake and exhaust hoods are free from any snow during the winter season. It is important to check your unit during a big snow storm, so it doesn't draw in any snow. If this is the case, please turn the unit OFF for a few hours.
11. Since the electronic control system of the unit uses a microprocessor, it may not operate correctly because of external noise or very short power failure. If this happens, unplug the unit (or, if hard-wired, turn off power at service panel) and wait approximately 10 seconds. Then, plug the unit in again (or restore power from service panel).
12. Do not make excessive use of fragrance appliances or chemicals since some may damage the unit components material.
13. For installation within a garage, make sure the unit door is always closed except during attended maintenance to reduce the likelihood of exhaust fumes to be introduced within the home.

TABLE OF CONTENTS

1 Safe Installation Zone 3
2 Unit Preparation 4
2.1 Choose an Appropriate Location for the Unit 4
2.2 Electrical Connection Type (Cord Connected or Hardwired) 4
3 Installation 4-12
3.1 Positioning the Unit 4-6
3.2 Combining with an AHU 7
3.3 Installing the Registers, Ductwork and Hoods 8-9
3.4 Installing a Tandem® Transition* Kit 9
3.5 Connecting the Controls 10
3.6 Connecting the Hardwire Connection (ERVS100S-HW and ERVS100S-HW-M units only) 11-12
4 Getting the Unit Started 13
4.1 Unit Setttings 13
4.2 Prepare the Unit 13
4.3 Booting Sequence 13
5 Maintenance 14-15
5.1 Quarterly Maintenance 14
5.2 Annual Maintenance 15
6 Warranty 15
7 Wiring Diagram 16
8 Service Parts 17
9 Troubleshooting 18

1 Safe Installation Zone

Installation requirements differ from zones A and B shown within map below, refer to sections 3.1 to 3.3.2 for specific details and cautions for each installation type. Zone B includes Canada.



2 Unit Preparation

- Inspect the exterior of the unit for shipping damage.
- Unit should never operate while the building is still in construction.
- ERVS100S-HW and ERVS100S-HW-M are shipped with door protection materials. Leave in place during construction process and remove after surrounding ceiling has been finished.

2.1 Choose an Appropriate Location for the Unit

- Within an area of the house where the ambient temperature is kept between 50°F (10°C) and 135°F (57°C);
- Away from living areas (dining room, living room, bedroom), if possible to reduce noise level;
- So as to provide easy access to the interior cabinet for maintenance;
- Close to an exterior wall, so as to limit the length of the insulated flexible ducts to and from the unit;
- Away from hot chimneys, electrical panel and other fire hazards;
- Within 28" of a power source (standard outlet, ERVS100S-PC unit only).

2.2 Electrical Connection Type (Plug Connected or Hardwired)

- According to your needs and applicable codes, make sure you have the appropriate model (ERVS100S-PC: plug connected unit, ERVS100S-HW or ERVS100S-HW-M: hardwired unit).

3 Installation

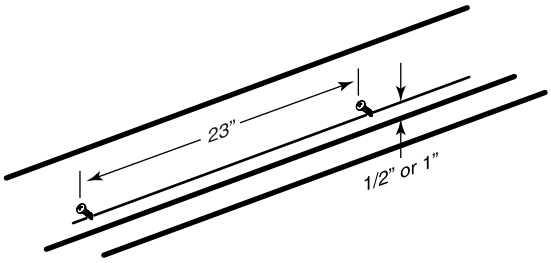
Unit must be installed in the horizontal orientation as shown in section 3.1.

3.1 Positioning the Unit

- Unit can be installed between 24″ on-center trusses, on top of 24″ on-center trusses in reversed position or under the ceiling, using brackets. A set of 4 brackets is included in the hardware kit, along with the necessary screws.
- The unit shall be connected to a 15-amp electrical circuit. It is recommended to label the circuit to identify this system as the Fresh Air System. If plug connected (ERVS100S-PC unit only), a standard 3-prong electrical outlet has to be available within 28″ of the unit.
- Allow a 12″ clearance for the door, core and filters to be removed for maintenance.

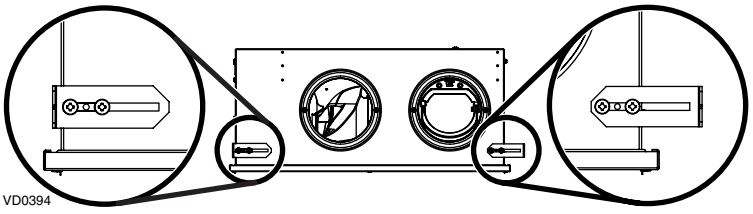
3.1.1 Installation in the ceiling (between 24″ on-center trusses) ERVS100S-HW and ERVS100S-HW-M only

1. Trace a level line on both trusses, at 1/2″ or 1″ from the bottom, for the unit bracket location (1/2″ will allow the unit door perimeter to lay on ceiling material while 1″ will result in flush mount installation; see **1** and **2** in next page). On one truss, screw half way on level line two no. 8 x 1½″ provided screws, leaving 23″ between each other.



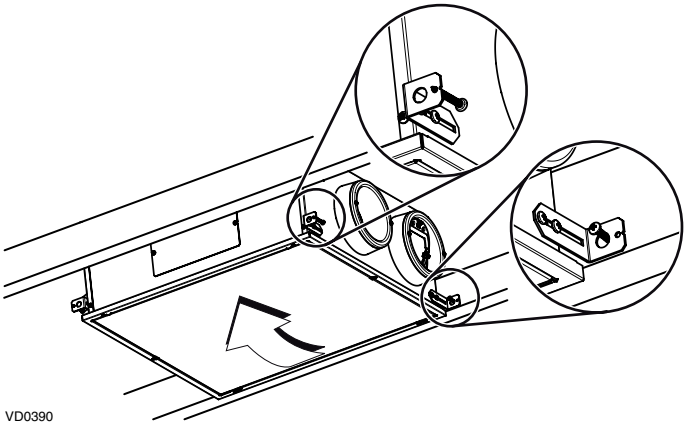
VD0391A

2. Mount the 4 brackets to the unit as illustrated at right, using two no. 10 x 5/8" screws provided for each bracket.
   TIP: Screw half way the screws to allow adjusment between trusses, see insets at right (left shows the minimum distance and right the maximum distance.


VD0394

3. Hang the lightest side of the unit on the screws mounted on the truss using the larger holes of the brackets.

4. Lift the other side of the unit and secure it to the other truss using one no. 8 x 1½″ screw per bracket, inserted through the smaller hole of the brackets.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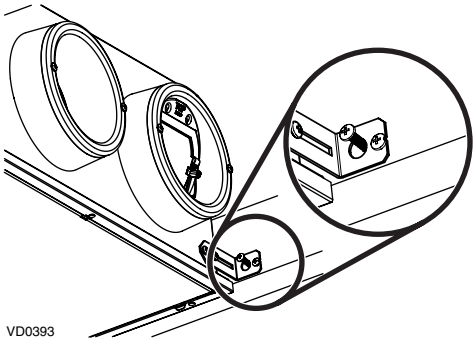
3 Installation (cont'd)

3.1 Positioning the Unit (cont'd)

3.1.1 Installation in the ceiling (between 24″ on-center trusses) (cont'd)

5. Secure the first brackets installed to the truss using one no. 8 x 1½″ screw per bracket, inserted through the smaller hole, then tighten completely the brackets screws to the unit.

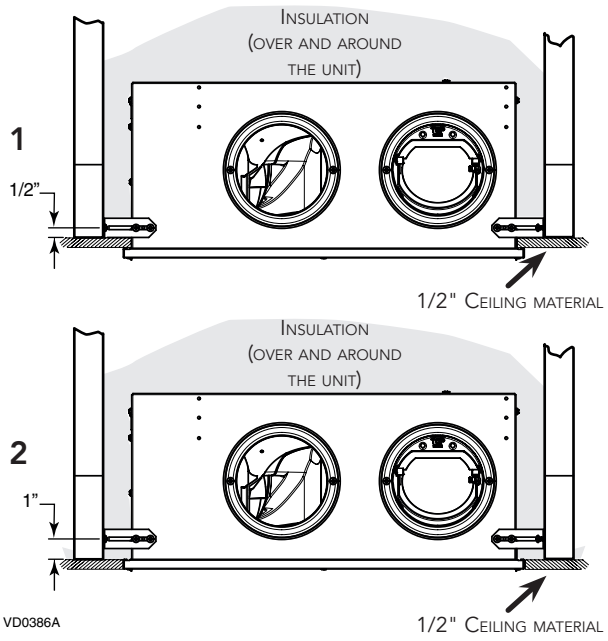


ZONE A

CAUTION

When installed in ceiling in the attic of a zone A, insulation must be spread over the unit. Installed unit area ambient temperature must be kept between 50°F (10°C) and 135°F (57°C).

6. Spread the insulation over and around the unit.

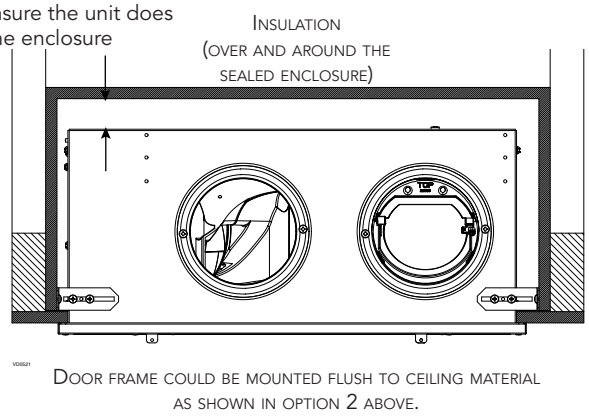


ZONE B

A clearance of about 1" is needed over the unit to ensure the unit does not touch the enclosure

CAUTION

When installed in the ceiling in an unconditioned space (e.g.: attic), above the unit in zone B, a sealed enclosure must be installed over and around the unit to avoid air leakage, condensation and mold growth risks. Insulation must be spread over and around the enclosure. Ducting must pass through the sealed enclosure and must be sealed to the enclosure.



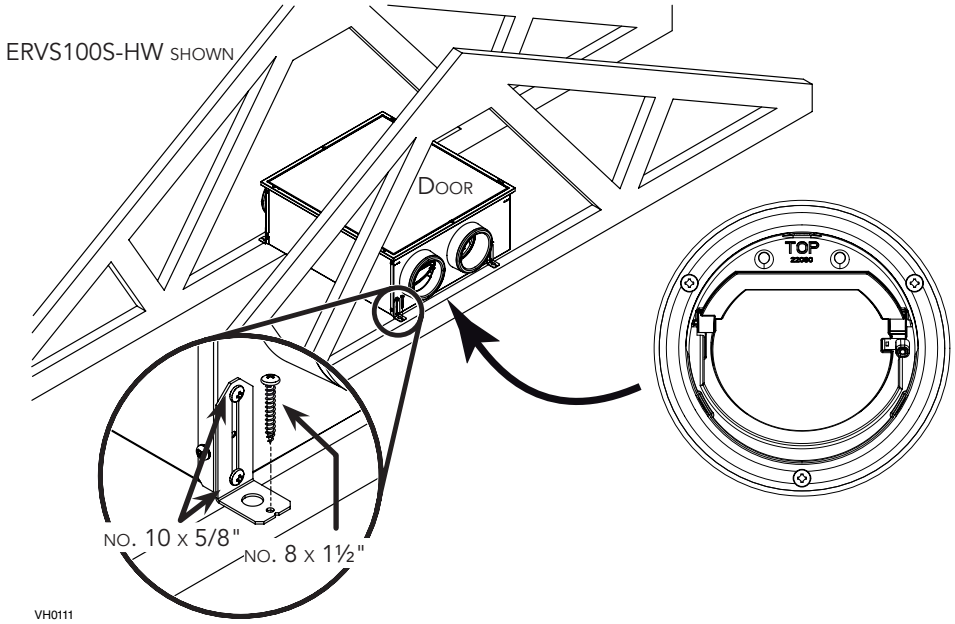
7. Spread the insulation over and around the sealed enclosure.

3 Installation (cont'd)

3.1 Positioning the Unit (cont'd)

3.1.2 Zone A only - Installation in the attic over the insulation (unit having its door on top)

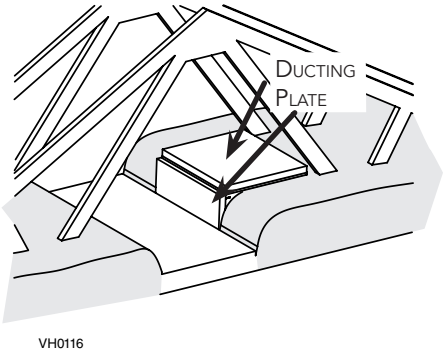
1. Rotate the backdraft damper 180° (no tool required) so that it falls in closed position and the word "TOP" engraved on the damper is up once the unit is in place.
2. Mount the brackets to the unit as illustrated below using two no. 10 x 5/8" screws provided for each bracket.
3. Secure the unit to the trusses using one no. 8 x 1½" screw provided for each bracket.
4. **IMPORTANT:** For unvented attic and without radiant barrier sheathing, insulation material must be added around and over the unit to prevent excess of heat in the unit. Ensure access is kept for product maintenance.



CAUTION

Installed unit area ambient temperature must be kept between 50°F (10°C) and 135°F (57°C), insulation material must be added over the unit if temperature in attic exceeds this limit in summer to protect electronic components from exposure to high temperature.

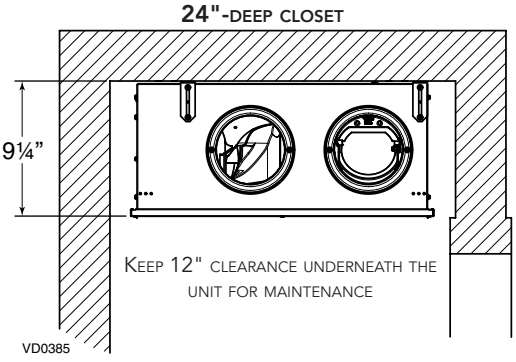
Spread the insulation around the unit, then use an insulated ducting plate to cover the unit door to maintain access inside the unit. Make sure to keep 12" clearance above the unit to remove the door, the core and filters for maintenance purposes.



3.1.3 Installation under the ceiling (in a conditioned space)

NOTE: Validate applicable codes.

1. Mount the brackets to the unit as illustrated above using two no. 10 x 5/8" screws provided for each bracket.
2. Secure unit to the ceiling using two no. 8 x 1½" screws provided for each bracket, making sure not to secure it into drywall alone.



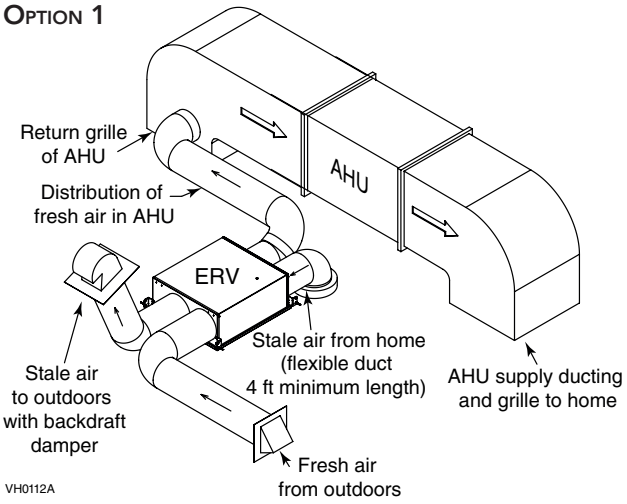
3 Installation (cont'd)

3.2 Combining with an AHU

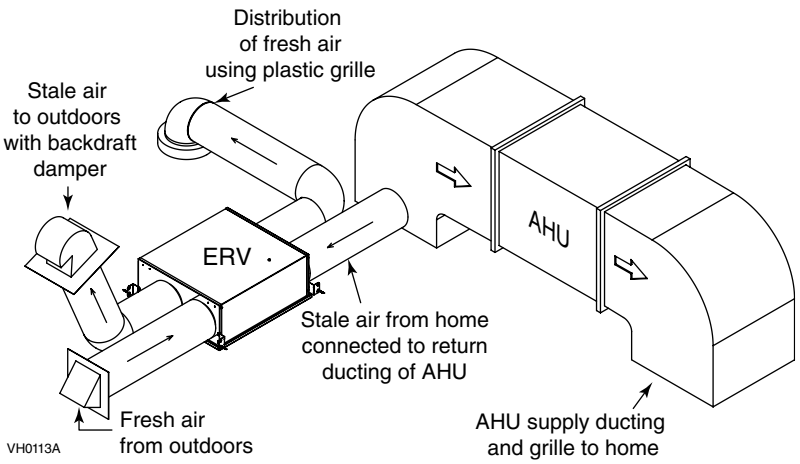
3.2.1 Recommended configurations

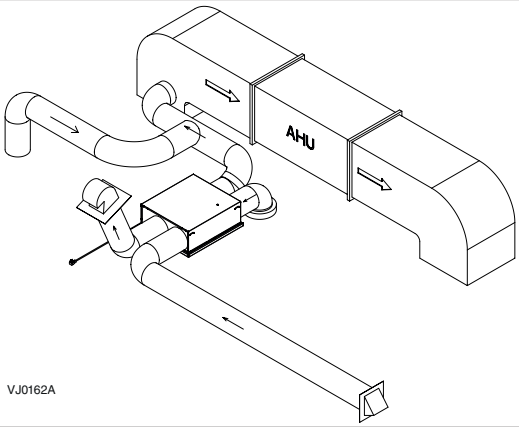
When the distribution of fresh air from the ERV is connected to the return of an AHU (such as in the image below, on the left), the connection should be done **as close as possible from one AHU return grille** to ensure proper functionning of the built-in fresh air damper.

Option 1



Option 2





Option 1 - If AHU return duct static pressure exceeds the -0.15 in w.g. threshold during AHU operation, indirect connection combined with a supplemental return grille or "T" connection with the conditioned space shall be used to ensure proper functioning of the built-in fresh air damper.

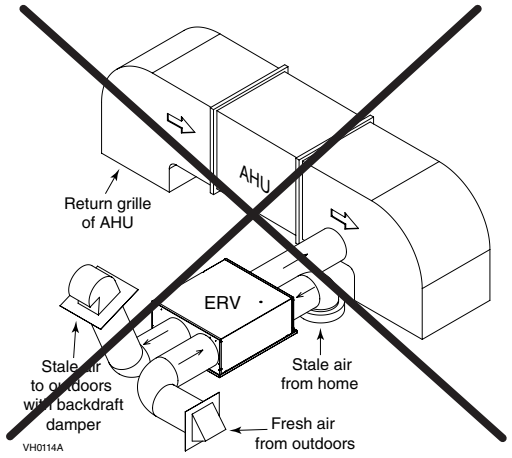
Option 3

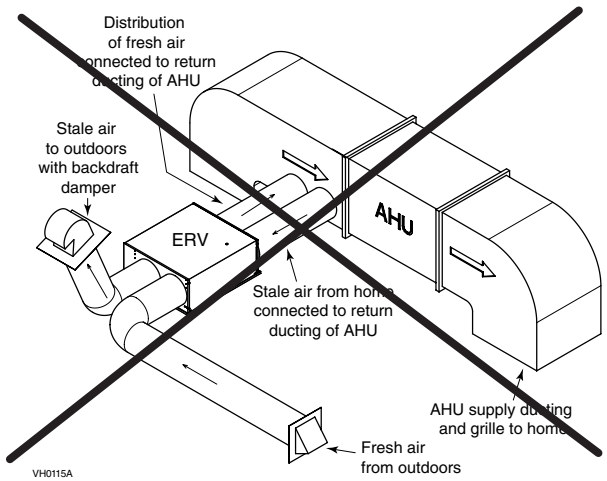
Unit can be installed on a fully ducted system (not shown)

3.2.2 Prohibited configurations

Distribution of fresh air from the ERV in the distribution ducting from the AHU (such as in the image below, on the left) may cause condensation issues during cooling season and must be avoided.

Connecting both distribution of fresh air from the ERV and stale air exhaust in the AHU return ducting (such as in the image below, on the right) must be avoided.





3 Installation (cont'd)

3.3 Installing the Registers, Ductwork and Hoods

3.3.1 Registers

⚠ 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.

Refer to applicable building codes to plan where the stale air exhaust registers and fresh air distribution registers should be installed. Below are some general recommendations.

Stale air exhaust registers:

- Install the stale air exhaust registers where the contaminants are produced: bathroom (up to 2), 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 away from the cooking applicances.
- Install the registers on an interior wall, 6 to 12 inches below the ceiling OR in the ceiling.

Fresh air distribution registers (Option 2 in 3.2.1):

- Install the fresh air distribution registers in bedrooms, dining rooms, living rooms and basement, if applicable.
- Keep in mind that the fresh air registers must be located as far as possible from the ERV stale air registers.
- Install the registers on an interior wall, 6 to 12 inches below the ceiling OR in the ceiling.
- If a register must be floor installed, direct the airflow up the wall.

3.3.2 Ductwork

⚠ 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

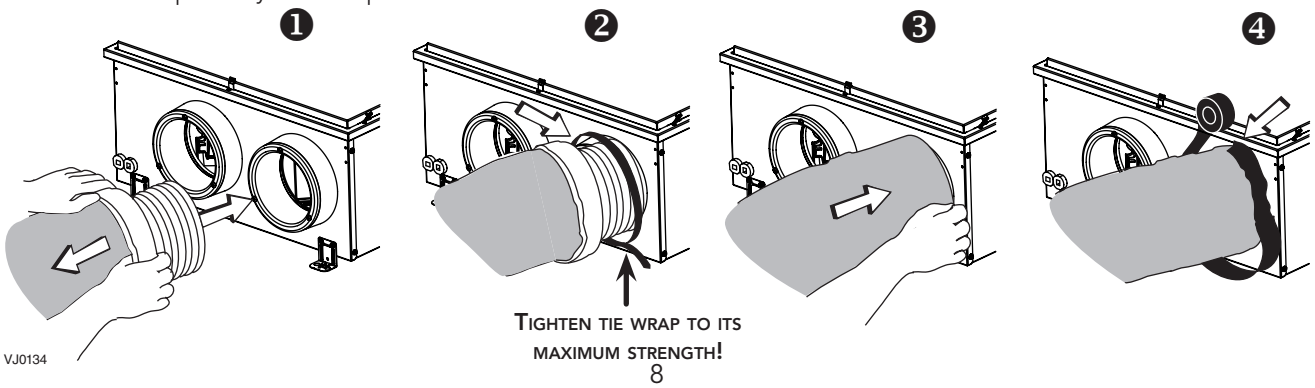
If ducts have to go through an unconditioned space (e.g.: attic), always use insulated ducts to prevent condensation formation inside and outside ducts, which could cause material damage and/or mold growth. Moreover, in zone B, if fresh air to building duct and/or stale air from building duct goes/go through an unconditioned space, these ducts must be buried with a minimum of R20 insulation in order to prevent heat recovery performance reduction and cooling of the distributed fresh air to the living areas during winter operation. Also, the unit must be set to operate continuously in cold conditions (below 50°F or 10°C) if these ducts have to go through an unconditioned space in zones A and B. Continuous air movement inside ducts will prevent condensation formation. The unit can be stopped temporarily for maintenance and/or repair purposes in such conditions.

- All units ports should be connected to 6" ducts, but can be connected to larger ducts using an appropriate transition.
- If you have to connect rigid ducts to the unit, use a short length (approximately 6") of flexible duct to avoid transmission of vibrations. Use a tie wrap and foil tape to connect the flexible duct to the port and to the rigid duct.
- Never use screws to connect rigid ducting to the ports.

Connecting insulated flexible ducts to the ports:

1. Pull back the insulation to expose the flexible duct.
2. Attach the flexible duct to the port using a tie wrap; ensure tie wrap is tighten to its maximum strength.
3. Pull the insulation over the joint, then pull the vapor barrier (shaded part in illustrations below) over the insulation. Make sure that the vapor barrier does not tear due to manipulation to avoid condensation within the ducts.
4. Apply foil tape to the joint, making an airtight seal. Avoid compressing the insulation when pulling the tape tightly around the joint. Compressed insulation loses its R value and causes water dripping in cold climates due to condensation on the exterior surface of the duct.

NOTE: If sealant mastic has to be used over the foil tape as an extra sealing layer, use water based mastic to ensure material compatibility with the port.



3 Installation (cont'd)

3.3 Installing the Registers, Ductwork and Hoods (cont'd)

3.3.3 Hoods

Refer to applicable building codes to plan where the stale air exhaust hood and fresh air distribution hood should be installed. Below are some general recommendations.

- Exhaust hood must have a backdraft damper.

⚠ WARNING

Make sure intake hood is located at least 10 feet away from any of the following (6 feet in Canada):

- 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 (6 feet in Canada) 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.

3.4 Installing a Tandem® Transition* Kit

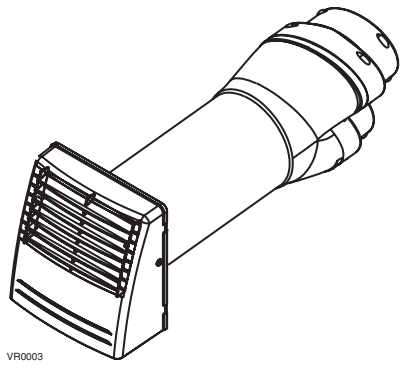
CAUTION

If using a Tandem Transition, a backdraft damper must be installed on the stale air to outdoors duct. If this causes an interruption in the duct insulation, insulation must be added around the backdraft damper to avoid condensation.

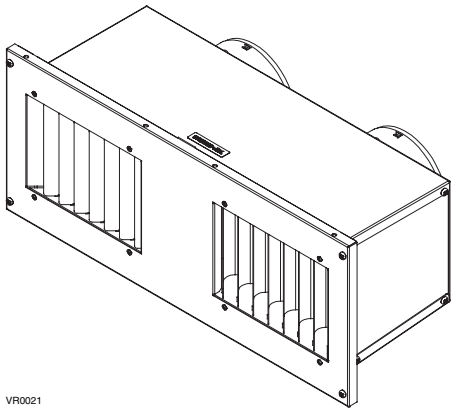
If desired, a Tandem transition kit can be used instead of 2 exterior hoods.

Follow the instructions included with the tandem termination kit.

*Patented.



Tandem VTYIK1 (USA) or 14690 (Canada)



Tandem V14695 (USA) or 14695 (Canada)

3 Installation (cont'd)

3.5 Connecting the Controls (energized by unit, low voltage)

- Controls are not included with this unit.
- Unit may be connected to a dry contact Standby switch if desired. In such case, unit remains powered on, but is put in Standby mode when the switch is turned on.
- This ERV can replace up to 2 bath fans. Where this is the case, unit should be connected to a 20-minute override control in each bathroom.

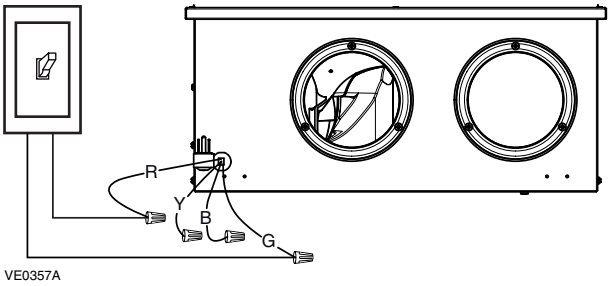
3.5.1 Connecting unit to a Standby switch

Install the dry contact Standby switch in a convenient place and connect it to unit as follows.

CAUTION

Ensure all unused wires are capped off.

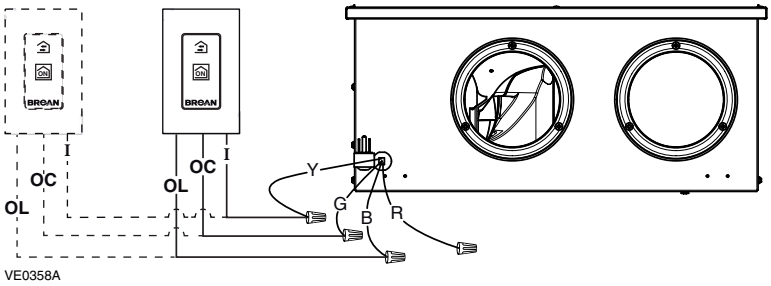
Switch position	Unit mode
Dry contact opened	Unit will run in the selected mode Refer to 4.1
Dry contact closed	Unit is kept in Standby mode



R RED
Y YELLOW
B BLACK
G GREEN

3.5.2 Connecting unit to 1 or 2 Broan VB20W 20-minute push-button control(s)

1. Install the 20-minute push-button control in the bathroom(s) following instructions included with the control.
2. Connect it to unit as follows.

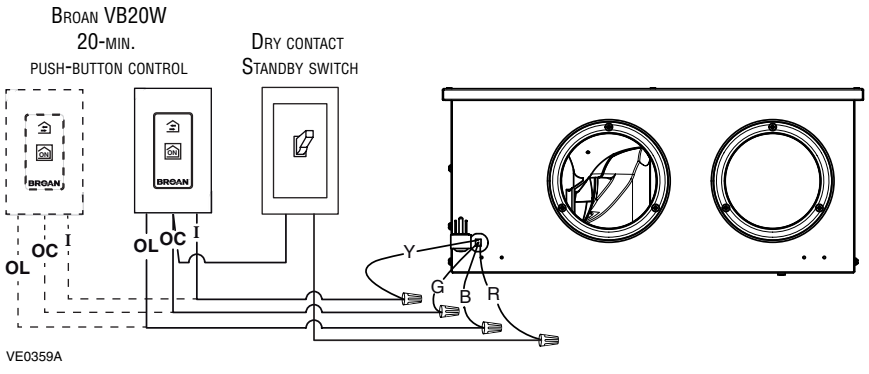


R RED
Y YELLOW
B BLACK
G GREEN

3.5.3 Connecting unit to a Standby switch AND 1 or 2 Broan VB20W 20-minute push-button control(s)

1. Install the 20-minute push-button control in the bathroom(s) following instructions included with the control.
2. Install the Standby switch in a convenient place.
3. Connect both with the unit as follows.

Switch position	Unit mode
Dry contact opened	Unit will run in the selected mode Refer to 4.1
Dry contact closed	Unit is kept in Standby mode



R RED
Y YELLOW
B BLACK
G GREEN

This connection allows the operation of VB20W push-button controls even if the dry contact standby switch is turned off.

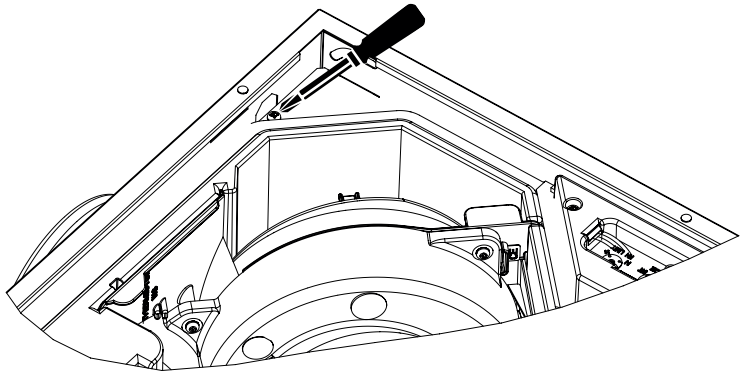
3 Installation (cont'd)

3.6 Connecting the Hardwire Connection (ERVS100S-HW and ERVS100S-HW-M units only)

⚠ WARNING

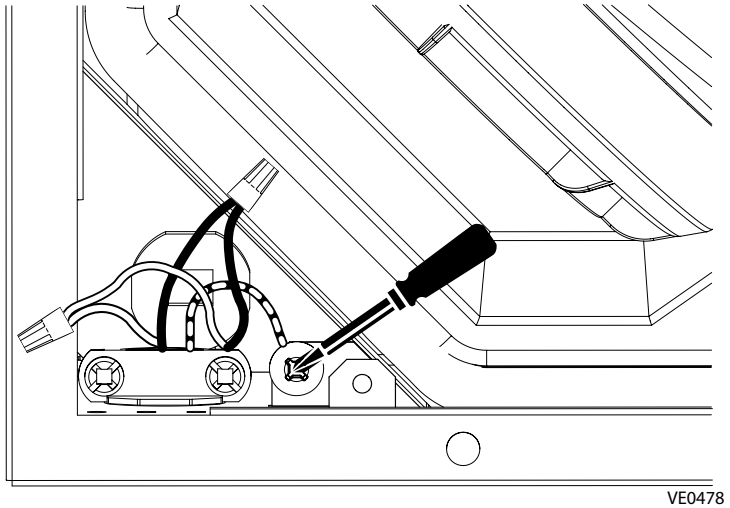
Risk of electric shock. Electrical wiring must be done by qualified personnel in accordance with all applicable codes and standards. Before connecting wires, switch power off at service panel and lock service disconnecting means to prevent power from being switched on accidentally. Hardwired connection requires the use of flexible conduit.

1. Open the unit door.
2. Remove and set aside the electrical compartment cover.



VE0479

3. Install the cable clamp connector included in the kit and tighten so cable clamp screws are accessible. Insert the end of the flexible conduit inside the unit, through the cable clamp connector.
4. Connect the ground wire from the flexible conduit to the GREEN ground screw inside the electrical compartment. Using included wire nuts, perform the hardwire connection as follows: BLACK wire to BLACK wire, WHITE wire to WHITE wire.

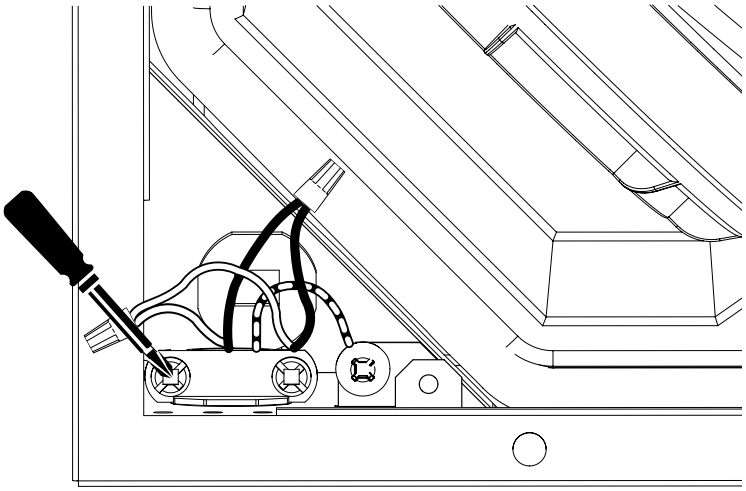


VE0478

3 Installation (cont'd)

3.6 Connecting the Hardwire Connection (ERVS100S-HW and ERVS100S-HW-M units only) (cont'd)

5. Fasten the flexible metal conduit to the provided cable clamp connector by tightening the screws on each side of the cable clamp connector. Do not overtighten such that the flexible metal conduit is damaged.



6. Insert all the wires inside the electrical compartment.
7. Reinstall and secure the electrical compartment cover, taking care not to pinch wires. Reinstall the unit door.
8. Restore power at service panel.

4 Getting the Unit Started

4.1 Unit Settings

- Settings should be changed by the installer after all construction work is over in order to comply to local building codes. Should the user want to change the settings later on, it should be done by an authorized servicer.
- Unit should never run while the building is still under construction.
- All units are factory set to Standby Mode, with the RH Limit set to the N position.
- See section 3.3.2 for specific details regarding winter operation.

4.1.1 Settings description

MODE

Position	Mode	Description
SB	Standby	Unit is off. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
INT	Intermittent	Unit works 20 minutes per hour in low speed. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
1	Low Speed	Unit runs at 65 cfm. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
2	High Speed	Unit runs at 105 cfm. Unit can be activated in high speed by the VB20W 20-minute push-button control, if unit is deactivated by RH limit.

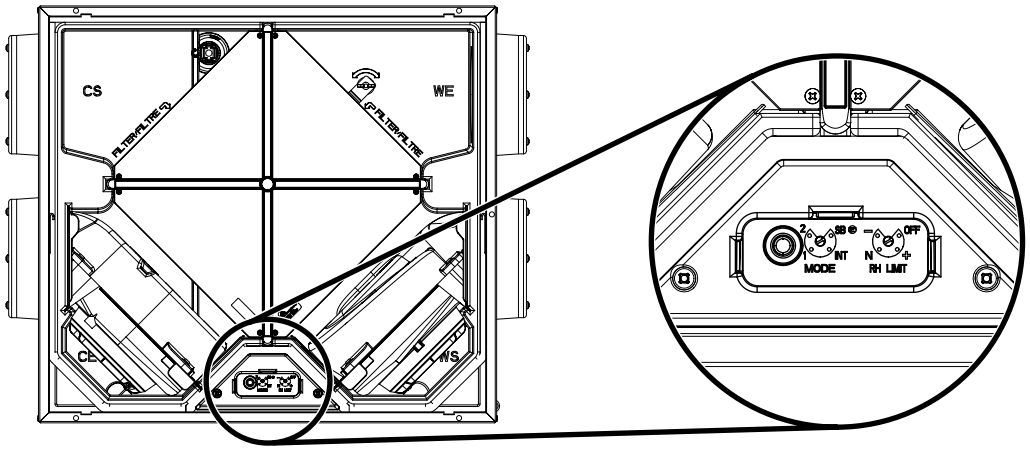
RH Limit

Position	Description
OFF	Relative humidity limit is deactivated.
+	Higher relative humidity limit.
N	Factory set relative humidity limit.
-	Lower relative humidity limit.

Factory settings

4.1.2 Mode and RH Adjustable Controls Location

Remove the door to access the MODE and RH adjustable controls.



VD0533

4.1.3 Choosing the right settings

Mode:

- Unit is factory set in Standby mode and should be set to the appropriate mode according to local building codes as well as the floor area of the residence, number of inhabitants and local weather conditions.

RH Limit:

- Unit is factory set to "N" and should normally remain in this setting unless local conditions require otherwise.

4.2 Prepare the Unit

- Make sure that the protective cardboard is removed from the door, if applicable.
- Verify damper orientation (see section 3.1.2).

4.3 Booting Sequence

When unit is powered on, it will go through a booting sequence during which it will test its components. The booting sequence will last less than a minute, after which the LED light will blink if there is a problem. If a Broan VB20W 20-minute push-button control is connected to the unit, it will also blink. The speed of the blinking indicates the nature of the issue:

● ● ● ● Slow blinking: RH and temperature sensor problem

● ● ● ● ● ● ● Fast blinking: motor problem

See the Troubleshooting section of this guide for detailed troubleshooting instructions.