



Model V42SNX

Fresh Air Ventilator

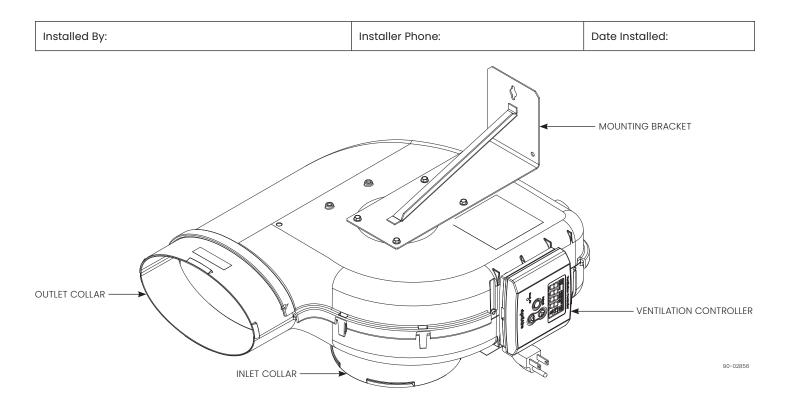


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INTRODUCTION AND COMPLIANCE STATEMENT

The Aprilaire® Model V42SNX Fresh Air Ventilator is designed to bring in precisely the right amount of outdoor air into today's efficiently designed homes. Duct the inlet of the ventilator to an outdoor air intake and duct the discharge to the HVAC system and then simply plug the unit in, set the amount of needed ventilation and select the desired temperature limits.

High/low temperature limits are set on the control to prevent bringing in outdoor air during the hottest or coldest period of the day. The built in control will automatically compensate for the ventilation time that is missed by bringing in additional outdoor air. Compliance with the requirements of ASHRAE 62.2 is met as the control adds ventilation time as needed to account for the fractional on-time and effectiveness of the ventilation schedule. The control will also ensure that ventilation occurs no less than one hour of every four. When properly installed and set, the Model V42SNX Fresh Air Ventilator will meet the mechanical ventilation requirements of:

- Energy Star Certified Homes, Version 3
- EPA Indoor airPLUS, Version 1
- 2012 International Residential Code (IRC)
- 2012 International Energy Conservation Code (IECC)



SAFETY INSTRUCTIONS

WARNING

- ATTENTION INSTALLER: Read this manual before installing. Improper installation or maintenance may cause property damage or injury. It is recommended that installation, service, and maintenance be performed by a trained service technician. This product must be installed in compliance with all local, state, and federal codes.
- ELECTRIC SHOCK HAZARD: 120 volts may cause serious injury from electric shock. Disconnect electrical power to the HVAC system and ventilator before starting installation or servicing. Leave power disconnected until installation/service is completed.
- Inhalation of toxic gases or fumes can be harmful. The fresh air intake must be mounted in a location away from sources of dangerous toxic gases. Ducting system must be separate from other household exhaust systems.

A CAUTION

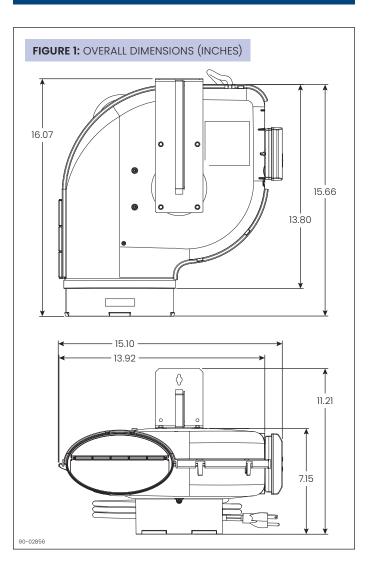
- SHARP EDGES MAY CAUSE INJURY FROM CUTS. Use care when cutting and handling ductwork. Always wear glasses/goggles and gloves when installing the unit.
- Dropping may cause personal injury or equipment damage. Handle with care and follow installation instructions.

NOTICE

EQUIPMENT DAMAGE MAY OCCUR IF INSTALLATION INSTRUCTIONS ARE NOT FOLLOWED.

- Disconnect power to HVAC system during wiring to avoid electrical shorts.
- Screwing the brackets or any other hardware into any other location but the designated mount location may cause damage and invalidate the warranty.
- The fresh air duct from outside and to the house must be fully insulated to prevent condensation from forming on the ductwork.

SPECIFICATIONS



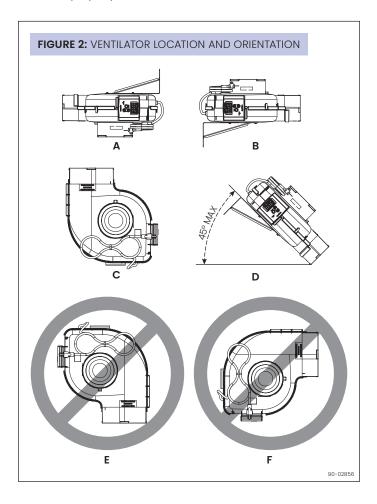
INSTALL ELECTRICAL OUTLET

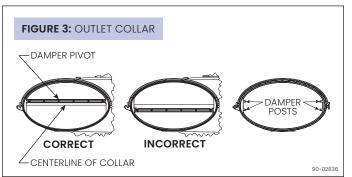
Install a standard NEMA 5-15 switched receptacle suitable for the location, near where the ventilator will be installed. The ventilator comes equipped with a 6 foot power cord with a standard 5-15P plug. Locate the switch in a suitable location to allow the user to manually override the mechanical ventilation system. Use label provided to label the switch "Mechanical Ventilation" or something similar to differentiate it from standard outlet or light switches.

VENTILATOR LOCATION AND ORIENTATION

Choose a location for the ventilator that is within 6 feet of the outlet into which the ventilator will be plugged. The ventilator must be installed with the round inlet duct collar facing up or down, or the oval outlet collar must face up. DO NOT install with the outlet collar positioned as shown in **FIGURE 2E** or **2F**, or the integral backdraft damper will not function properly.

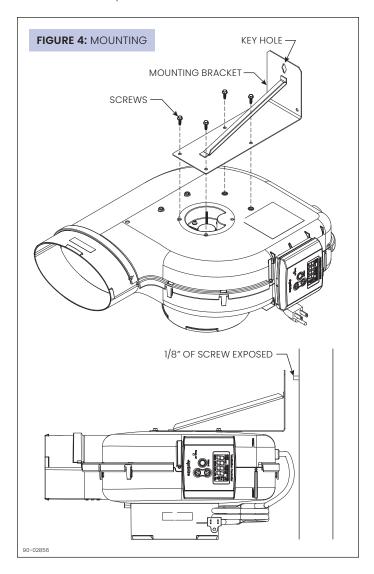
After deciding which orientation the ventilator will be installed, make sure the pivot of the backdraft damper is located above the centerline of the collar. Remove the backdraft damper and rotate it 180° if needed to make sure the backdraft damper functions properly. See **FIGURE 3**.

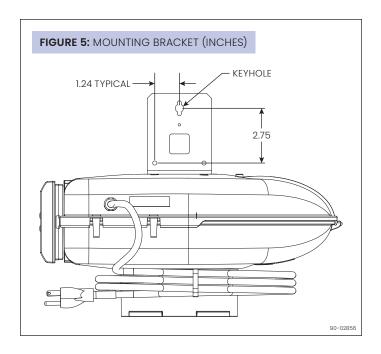


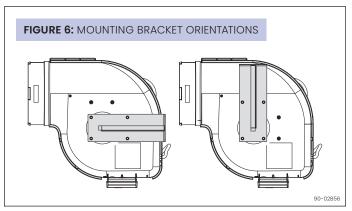


MOUNT THE VENTILATOR

- Attach the mounting bracket to ventilator using the (4) provided screws. See FIGURE 4. Ensure screws are snug, do not over tighten. NOTE: Using screws other than those provided may result in product damage.
- 2. Drive (1) screw, field provided, into the truss member or other appropriate surface where the ventilator will be mounted, leaving approximately 1/8" exposed.
- 3. Hang the mounting bracket on the screw by the keyhole. See FIGURE 4.
- **4.** Drive (1) screw fully into each of the (2) remaining holes in the mounting bracket and tighten the keyhole screw.
- 5. Ensure the backdraft damper in the oval outlet collar is positioned correctly so that it will open when the ventilator is on, and will close on its own when the ventilator is off. If necessary, remove the damper, rotate it 180°, and reinstall on the other set of pivots. See FIGURE 3.







MOUNT INTAKE HOOD

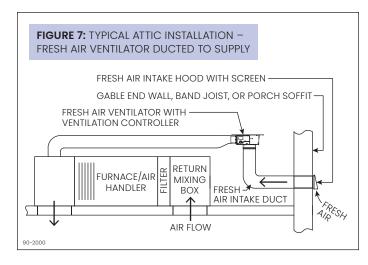
Install a weather tight hood with a bird screen.

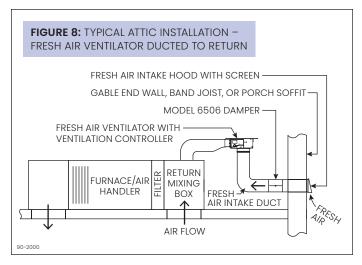
Cut a hole in the exterior wall that is large enough to fit 6" insulated flexible duct through with minimal compression of the insulation. Pull the duct through the hole and attach the flex duct to the collar of the hood. Use good quality duct tape or a plastic zip-tie to secure the duct to the collar. Pull the insulation and vapor barrier over the duct and tape it to the collar.

IMPORTANT

The end of the insulation must be sealed to prevent condensation from forming inside the insulation. If a plastic zip-tie is used to secure the insulation to the hood collar, also tape the end to seal it against condensation problems.

Press the hood against the outside wall and secure in place with screws; seal around the perimeter of the hood with caulk.





INSTALL DUCTWORK

Install 6" diameter flexible, insulated duct from the round inlet collar of the unit to the intake hood and from the oval outlet collar of the unit to the supply or return side of the HVAC system.

If the fresh air is being discharged into the return side, a Model 6506 powered, normally closed damper must be installed in the inlet duct.

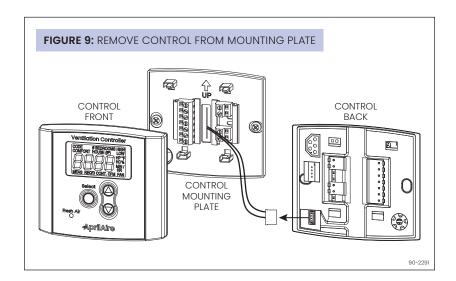
NOTE: Ensure the duct covers all 4 retaining tabs on each duct collar and enough of the collars remain exposed for proper tape adhesion.

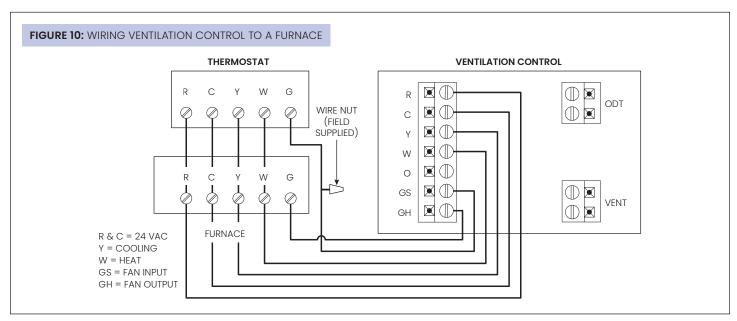
WIRING THE CONTROL TO THE HVAC SYSTEM

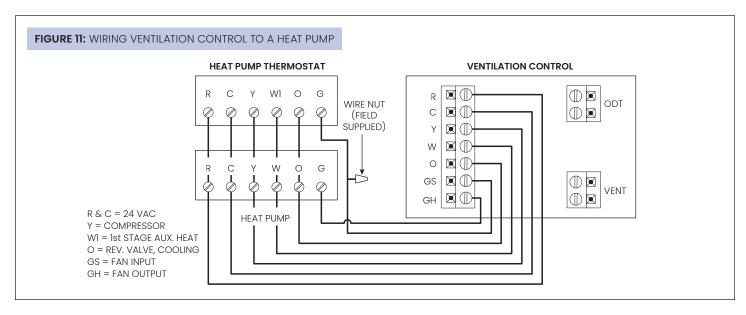
NOTICE

Disconnect power to HVAC system during wiring to avoid electrical shorts.

- Remove the control from the mounting plate by gently pulling on the control then disconnecting the control connector. Set control aside in a safe place until all wiring has been completed.
- 2. Run a 6-conductor (min.) cable for furnace/AC applications or a 7-conductor (min.) cable for heat pump applications between the control and the HVAC system.
- 3. Wire to the HVAC system in accordance with FIGURE 10 if installed in a furnace/AC application or FIGURE 11 if installed with a heat pump.







CONNECTING THE CONTROL TO THE VENTILATOR

If the ventilator is ducted to the supply side of the HVAC system (see FIGURE 7 on page 4), plug the Control Connector into the back of the control at the location shown in FIGURE 12. Route the connector wire through the channels in the control and reattach the control to the mounting plate. Restore power to the HVAC system and plug in the ventilator when complete.

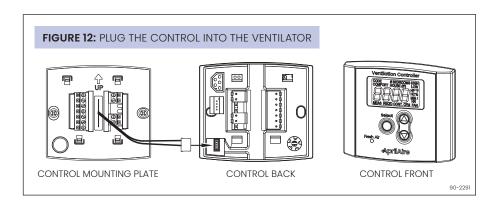
If the ventilator is ducted to the return side of the HVAC system and a separate damper is installed (see FIGURE 8 on page 4), an additional transformer (Aprilaire Part #4010) may be required if the HVAC system transformer does not have enough capacity to power a damper (10 VA required).

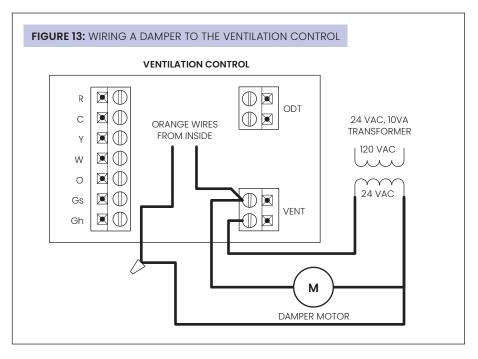
Cut the plug off of the end of the control connector (see **FIGURE 9**) and strip approximately 1/4" of insulation off the end of each of the orange wires.

Insert one of the orange wires into one of the **VENT** terminals and use a wire nut to connect the other wire to one side of the added transformer (see **FIGURE 13**).

Wire the damper motor and transformer as shown in **FIGURE 13**.

Restore power to the HVAC system and plug in the ventilator when complete.

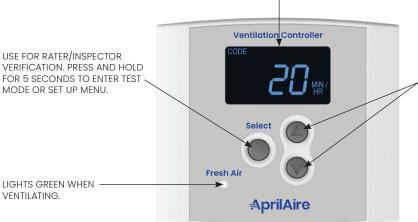




OPERATION

The display will appear faint normally; the first press of any button will turn on the display at full power.

SHOWS THE VENTILATION TIME SETTING
(MINUTES/HR), MODE OF OPERATION
(CODE OR COMFORT) AND WHETHER THE HVAC
FAN HAS BEEN TURNED ON WHEN VENTILATING.



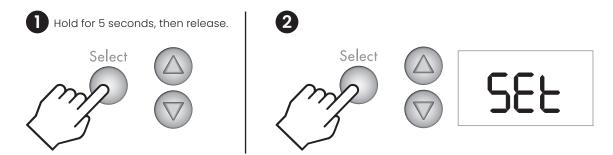
USE TO OVERRIDE THE CALCULATED VENTILATION TIME SETTING (6 TO 60 MINUTES/HR). PRESS AND HOLD ▼ TO TURN VENTILATION OFF.

TO RETURN TO THE CALCULATED SETTING, GO COMPLETELY THROUGH THE SET UP MENU.

SET UP

NOTICE

Before setting up the control for use, the amount of ventilation air being delivered (CFM) by the installed ventilation system must be measured.



Throughout the Set Up Menu, the \triangle and ∇ buttons are used to change values, the **Select** button is used enter the value and move on to the next Set Up Menu item.

TABLE 1: SET UP MENU		
Menu Item	Values ▲ ▼	Description
HC HP	HP or HC	HP if wiring to a heat pump. HC if wiring to furnace and AC.
A 10	A 10 or A 13	ASHRAE code year. A 10 for ASHRAE 62.2 2010 A 13 for ASHRAE 62.2 2013
# BEDROOMS	1 to 10	Number of bedrooms – used to calculate required continuous ventilation rate.
2500	500 to 7500 square feet	Square footage – used to calculate required continuous ventilation rate.
MEAS CFM	30 to 250 CFM	Measured outdoor airflow delivered during ventilation.
95 °F	OFF, 85°F to 105°F	Ventilation high temperature limit. Ventilation is limited when the outdoor temperature exceeds the setting. Turn OFF if no high limit is desired.
50 .t	OFF, -10°F to 40°F	Ventilation low temperature limit. Ventilation is limited when the outdoor temperature falls below the setting. Turn OFF if no low limit is desired.

TABLE 1: SET UP MENU		
Menu Item	Values ▲ ▼	Description
On FAN	On, blnd, or OFF	ON HVAC fan turns on whenever ventilation occurs. bLnd (blend) HVAC fan turns on with ventilation only when the outdoor temperature is outside a set range. OFF HVAC fan is not turned on with ventilation.
50 FAN	OFF, 60°F to 5°F less than Vent. High Temp. Limit	Only available when blnd is selected. When the outdoor temperature is above the setting, the HVAC fan will be turned on to mix (blend) outdoor air with indoor air for tempering.
50 LOW FAN	OFF, 5°F less than Vent. Low Temp. Limit to 55°F	Only available when bLnd is selected. When the outdoor temperature is below the setting, the HVAC fan will be turned on to mix (blend) outdoor air with indoor air for tempering.
CODE	codE or cFrt	codE No RH limits and any missed ventilation due to temperature is made up per ASHRAE 62.2-2010. cFrt (comfort) Adds indoor RH limits to ventilation; ventilation missed due to limits is not made up.
55 ^{HIGH} %	OFF, 45% to 70% RH	Only available when cFrt is selected. When the outdoor RH exceeds the setting, ventilation will not occur.
50 %	OFF, 10% to 30% RH	Only available when cFrt is selected. When the outdoor RH drops below the setting, ventilation will not occur.

When all Set Up Menu options have been entered, the control will display ${\bf donE}.$

TEST MODE

After wiring and set up have been completed, Test Mode can be used to verify that all components in the ventilation system function and that wiring to the HVAC system fan is correct.

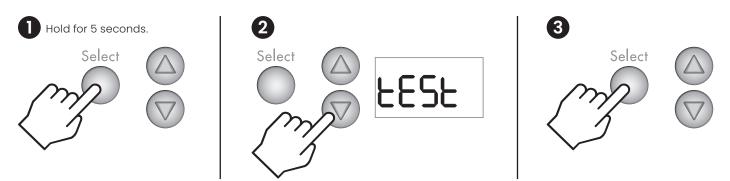


TABLE 2: TEST MOD	BLE 2: TEST MODE MENU		
Test Sequence	Description		
76 *	Shows °F to indicate that no separate outdoor temperature sensor has been installed. V42SNX installations do not require a separate sensor – outdoor temperature is measured by the control's on-board sensor.		
FEZF	tESt shows on the display, the green Fresh Air LED will light and either the damper will open or the power ventilator will turn on depending on what has been wired to the VENT terminals.		
LESE FAN	After 15 seconds, the HVAC fan will turn on if it has been wired and set up to do so. The display will show FAN along with tESt .		
CODE MIN/	After 45 seconds Test Mode automatically completes and the display returns to the operating display.		

RATER/INSPECTOR VERIFICATION

To verify the ventilation time setting, press the **Select** button to scroll through the calculated Required Continuous CFM and the Measured CFM for this installation. If any value does not match the expected value, the Set Up Menu must be entered to change the floor area, number of bedrooms or measured CFM.











The calculation used for the ventilation time setting is (all calculations compliant with ASHRAE Standard 62.2-2010):

Minutes per Hour = 60 *
$$\left(\frac{\text{Required Continuous CFM}}{\text{Measured CFM}}\right)$$

Measured CFM is entered during set up and Required Continuous CFM is calculated according to the equation below:

Required Continuous CFM = ((Floor Area ft2 * .01) + (No. of Bedrooms + 1) * 7.5)

SEQUENCE OF OPERATION

"CODE" SETTING

The control will turn on ventilation with a heating, cooling or fan call for the set number of minutes during a one-hour cycle period. If the outdoor temperature is above the high temperature ventilation limit, ventilation will not occur with a cool or fan call, but if it is below the low temperature ventilation limit it will occur with a heat call. If the HVAC equipment does not turn on enough to meet the ventilation time within the hour, the control will turn on ventilation without a call, if the outdoor air temperature is within the high and low ventilation temperature limits. The control will also turn on the HVAC system blower, if wired and set up to do so.

If the outdoor temperature exceeds the limits set at the end of the first hour, then no additional ventilation will occur for another 60 minutes, and the cycle period will automatically adjust to four hours. When the ventilator starts again, it will sample the air temperature and if in range, will meet the set amount of ventilation during the four-hour cycle period. For example, if the Vent Time was set to 25 minutes per hour and the air temperature fell below the low limit setting ventilation would only occur during a heating call. If the heating only operated for 10 minutes during the hour, the control will automatically change the cycle period to four hours and work to provide the additional 90 total minutes of ventilation (25 min/hr * 4 hours = 100 minutes, minus the 10 minutes of ventilation that occurred during heating) during the four-hour cycle period.

If the air temperature is still out of range, the control will automatically switch to an 8-hour cycle period, then a 12-hour cycle period and finally a 24-hour cycle period. During 8, 12 and 24 hour cycle periods, the total ventilation time increases to compensate for ventilation effectiveness as defined in ASHRAE Standard 62.2-2010. When the cycle period automatically adjusts to 24-hours, the control will turn on ventilation to meet the requirements even if the temperature is outside of the set limits.

"COMFORT" SETTING

The control will turn on ventilation with a heating, cooling or fan call by the HVAC equipment, if the outdoor air temperature is within the high and low ventilation temperature limits and the outdoor RH is within the high and low RH limits, for the set number of minutes during a one-hour cycle period. If the HVAC equipment does not turn on enough to meet the ventilation time within the hour, the control will turn on ventilation without a call, if the outdoor air temperature and indoor RH is within the set limits. The control will also turn on the HVAC system blower, if wired and set up to do so.

MEASURE DELIVERED AIRFLOW

- 1. Make sure the ventilator is plugged in and the integral control is wired to the HVAC system.
- 2. Use 1/4" flexible tubing to attach a pressure gauge set to "w.c. (sometimes shown as "in. w.g." or "in. H₂O") to the inlet and outlet pressure ports on the ventilator. The pressure gauge should have as small a range as possible to get a meaningful measurement a range of 1.0" w.c. should be sufficient. Connect the high or "+" port of the gauge to the outlet pressure port on the ventilator, and the low or "-" port of the gauge to the inlet pressure port on the ventilator. See FIGURE 14.
- 3. Turn on the ventilator by using the ▲ button to increase the ventilation setting to 60 min/hr.
- 4. Use TABLE 3 to convert the pressure reading to delivered airflow. If the pressure reading falls between listed values, either use the lower value or interpolate between values: CFM = Lower Value + [(Higher Value Lower Value) * 10 * (Pressure Reading Lower Value Pressure)]. The following is an example:
 - **a.** Measured Pressure Reading is 0.34 "WC.
 - **b. TABLE 3** lists 230 CFM @ 0.3 "WC. and 220 @ 0.4 "WC.
 - c. Either use 220 CFM or interpolate:

CFM = 230 - [(230-220) * 10 * (0.4-0.34)] = 230 - [(10) * 10 * (0.06)] = 230 - 6 = 224 CFM

Interpolating will demonstrate higher delivered airflow, but requires a calculation to be done.

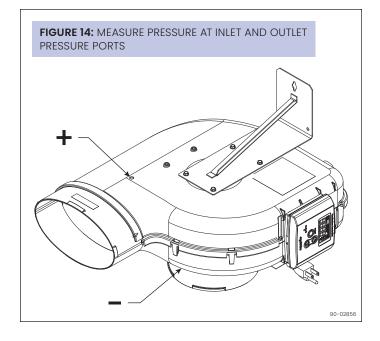


TABLE 3: DELIVERED AIRFLOW RATES		
Measured Pressure ("w.c.)	Delivered Airflow (CFM)	
0.1	250	
0.2	240	
0.3	230	
0.4	220	
0.5	210	
0.6	195	
0.7	180	
0.8	165	
0.9	150	
1.0	135	
1.1	115	
1.2	95	
1.3	75	
1.4	55	
1.5	30	

TROUBLESHOOTING

TABLE 4: TROUBLESHOOTIN	4: TROUBLESHOOTING GUIDE	
Code	Explanation	Correction
El	Sensor failure. Non-recoverable fault. Not field-correctable.	Call technician to inspect HVAC equipment for damage. If no damage found, power cycle the control/unit. If error code does not resolve itself, replace control.
E2	External temperature sensor was detected at start-up, but has failed when the control is configured to use it. The control will continue as though the temperature limits are set to OFF.	Inspect the ODT sensor connection for loose or broken wires. If no issue found, follow the instructions in TESTING ODT SENSOR RESISTANCE section below. If the ODT sensor functions correctly, replace control.
E4	Invalid vent input – can be caused by bad ventilation setup variables or sensor error.	You can re-enter installer setup by pressing and holding the Select button to check the installer setup. If the installer setup is OK, replace control.
Ventilator does not operate in Test Mode	Incorrect installation	Review wiring diagrams and ensure proper control installation.
Ventilator only operates in Test Mode	Measured conditions are outside programmed limits.	Ventilation should not occur when outdoor temperature and humidity are outside programmed limits. If outdoor conditions are confirmed within programmed limits, follow the instructions in TESTING ODT SENSOR RESISTANCE section below.
Ventilator operates constantly	Ventilation run time is set to 60 min/hr.	You can re-enter installer setup by pressing and holding the Select button to check the installer setup. Ensure Number of Bedrooms, Square Footage, and Measured Airflow are entered correctly.
Ventilator control "chatters" or clicks ON and OFF rapidly	Improper wiring between controller (GH), thermostat (G), and furnace or heat pump (G).	Separate controller GH and thermostat G wires if connected. Refer to diagram in the WIRING THE CONTROL TO THE HVAC SYSTEM section for proper wiring to furnace (see FIGURE 10 on page 5) or heat pump (see FIGURE 11 on page 5).
Air is blowing out of the intake hood.	Backdraft damper is open.	Make sure the unit is mounted in the proper orientation – outlet cannot point down. Remove the backdraft damper and rotate it 180° so that it closes when the ventilator turns off.

TESTING ODT SENSOR RESISTANCE

- 1. Disconnect the ODT sensor leads from the control terminals.
- 2. Measure the resistance across the wires with an ohmmeter.
- ${\bf 3.}$ Confirm the reading with the temperature in ${\bf TABLE}~{\bf 4.}$
- 4. Reconnect the ODT sensor leads.
- 5. If the resistance value (+/- 10 k Ω) does not match the temperature value, replace the ODT sensor.
- **6.** Replace the filter in the ventilator and press the outside edges of the filter door to snap it in place.

TABLE 4		
Outdoor Temperature (°F)	Resistance (kΩ) ±10	
-30	231.8	
-20	163.4	
-10	117.3	
0	84.8	
10	62.2	
20	46.1	
30	34.4	
40	26.1	
50	19.9	
60	15.3	
70	11.9	
80	9.3	
90	7.3	
100	5.8	

LIMITED WARRANTY

Terms of Coverage

Your AprilAire® Ventilator is expressly warranted to be free from defects in materials or workmanship for five (5) years from date of purchase.

What Is Covered

The exclusive obligation of AprilAire under this Limited Warranty shall be, at the sole discretion of AprilAire, to supply, without charge, a replacement for any component or product which is found to be defective. A defective part will be replaced pursuant to this Limited Warranty with a genuine AprilAire part. A defective product will be replaced pursuant to this Limited Warranty with a new AprilAire product of equal or similar features and functionality if the original product has been discontinued or is no longer available.

Not Covered by the Limited Warranty

- Consumable or maintenance products, such as, but not limited to: Air Filters, Evaporative Humidifier Water Panels, Steam Canisters, or Steam Humidifier Electrode Wires.
- Products purchased from third parties that were previously used, such as previously-used products purchased from eBay, similar third party/auction sites, or individuals selling used products.
- Labor charges, shipping costs, removal fees, service fees, or reinstallation costs.
- · Materials furnished by the installer.
- Damage caused by misuse, abuse, improper installation, or failing to install, use, or maintain the product in accordance with the instructions provided.
- Damage to HVAC equipment caused by improper installation(s) or misapplication installation(s).
- Modifications, changes, repurposing, or alterations to the AprilAire product.
- Extended warranties or satisfaction guarantees offered by third parties
- Cosmetic damage or normal wear and tear, including, but not limited to: scratches, peeling finish, or dents that do not impede the mechanical functionality of the product.
- Damage caused by acts of nature, including but not limited to: fire, collision, flood, wind, power surge, lighting strike, or mold.
- · Damage caused during transit.
- Damage caused during installation due to failure to follow local, state, or federal laws, statutes, codes, or ordinances.
- Damage caused by defects in materials furnished by the installer.

Limit of Liability

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFOREMENTIONED EXPRESS WARRANTY PERIOD. APRILAIRE LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, OTHER THAN DAMAGES FOR PERSONAL INJURIES, RESULTING FROM ANY BREACH OF THE AFOREMENTIONED IMPLIED WARRANTIES OR THE ABOVE LIMITED WARRANTY IS EXPRESSLY EXCLUDED. THIS LIMITED WARRANTY IS VOID IF DEFECT(S) RESULT(S) FROM FAILURE TO INSTALL THE PRODUCT ACCORDING TO THE APPILAIRE INSTALLATION INSTRUCTIONS. IF THE LIMITED WARRANTY IS VOID DUE TO MISAPPLICATION OR IMPROPER INSTALLATION, ALL DISCLAIMERS OF IMPLIED WARRANTIES SHALL BE EFFECTIVE UPON INSTALLATION,

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation(s) may not apply to your situation. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Register Your AprilAire® Product



Thank you for choosing AprilAire. Register your product at **aprilaire.com/warranty** to receive important updates and notifications, and to streamline the process in the unlikely event you file a claim.

Your warranty registration information will not be sold or shared outside of this company.

Make a Warranty Claim

For questions regarding the Limited Warranty or to initiate a claim, contact AprilAire Customer Service at 1.800.334.6011 Monday through Friday, 7:00 a.m. to 5:00 p.m. Central Time.

At the sole discretion of AprilAire, you may be required to: return the product not later than thirty (30) days after the warranty period to the place of purchase or (if directed) to AprilAire, contact a professional contractor to provide warranty service, submit a product for testing related to a warranty claim, and/or send pictures of the original product with the serial number (if applicable) to AprilAire Technical Support for inspection as a condition to reviewing a claim and/or receiving a replacement product under this Limited Warranty.

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