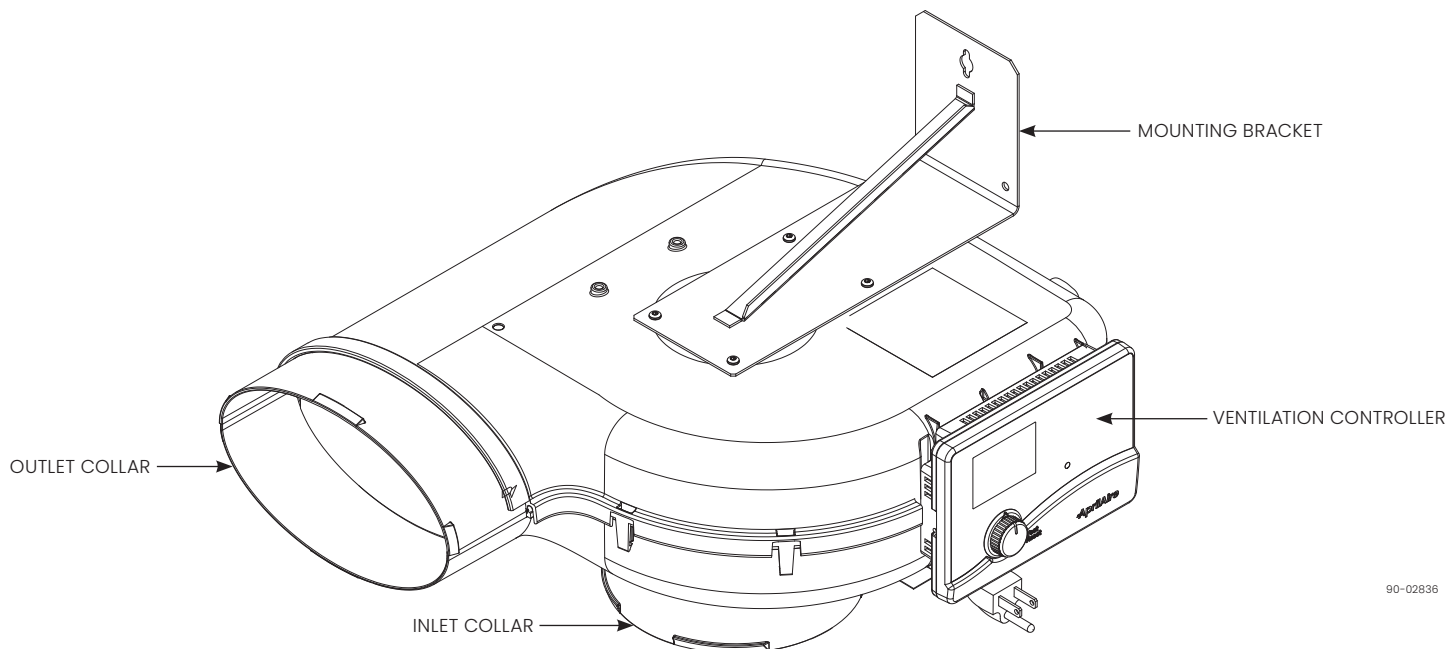


### Model V42SNA

Fresh Air Ventilator

Installed By:	Installer Phone:	Date Installed:
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90-02836

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## INTRODUCTION AND COMPLIANCE STATEMENT

The Aprilaire® Model V42SNA 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 V42SNA 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)

Product Info &  
Digital Manual



**READ AND SAVE THESE INSTRUCTIONS**

## 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.

### ⚠ 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

TABLE 1: DESIGN AIRFLOW AND EFFICACY

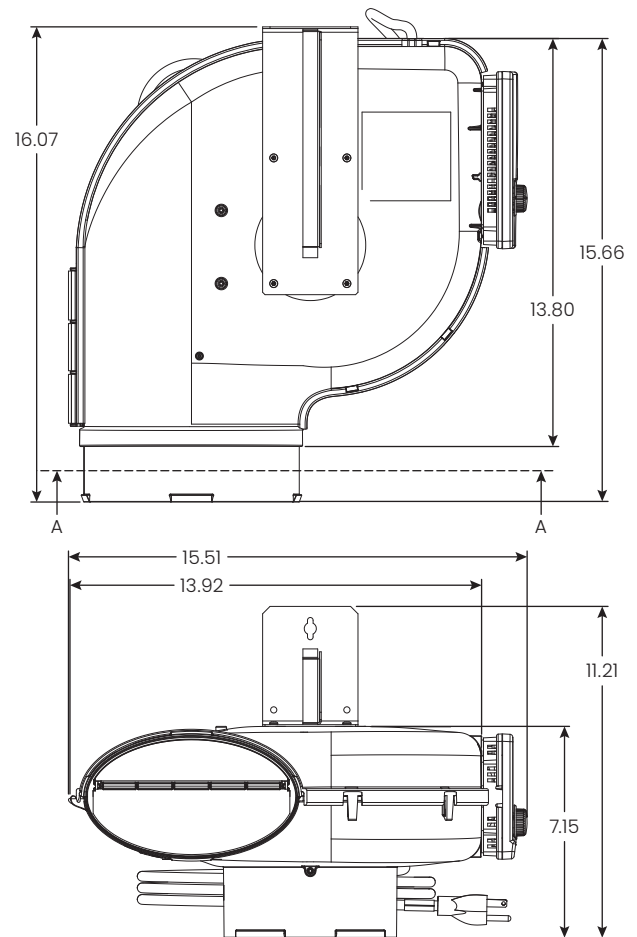
External Static Pressure* ("w.c.)	Airflow (CFM)	Current (amps)	Efficacy (CFM/watt)
0.0	245	.63	3.30
0.2	220	.64	2.96
0.4	190	.64	2.57
0.6	160	.63	2.12
0.8	120	.61	1.69
1.0	95	.60	1.35

\*Measured across ventilator.

**Temperature Range:** 0°F–160°F. **Voltage:** 115 VAC, 1 phase, 60 Hz.

**NOTE:** For commissioning using onboard pressure ports, see TABLE 3.

FIGURE 1: OVERALL DIMENSIONS (INCHES)



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## INSTALL ELECTRICAL OUTLET

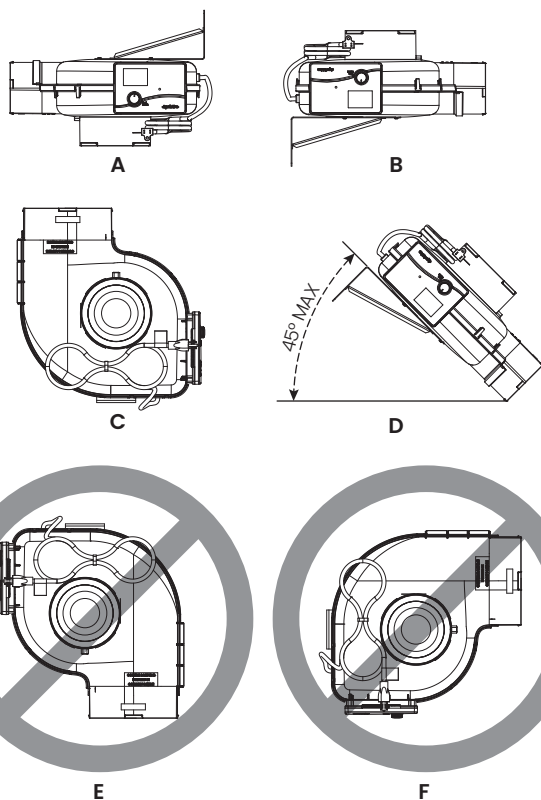
Install a standard NEMA 5-15 switched receptacle suitable for the location, near where the ventilator will be installed. The ventilator comes equipped with a 6 foot power cord with a standard 5-15P plug. Locate the switch in a suitable location to allow the user to manually override the mechanical ventilation 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.

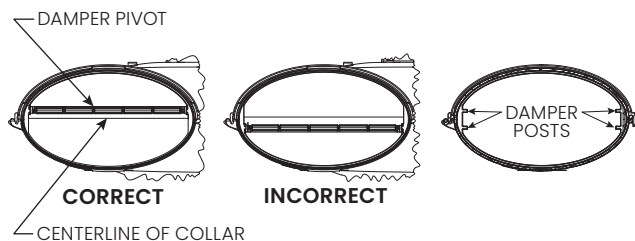
After deciding which orientation the ventilator will be installed, make sure the pivot of the backdraft damper is located above the centerline of the collar. Remove the backdraft damper and rotate it 180° if needed to make sure the backdraft damper functions properly. See **FIGURE 3**.

**FIGURE 2: VENTILATOR LOCATION AND ORIENTATION**



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**FIGURE 3: OUTLET COLLAR**

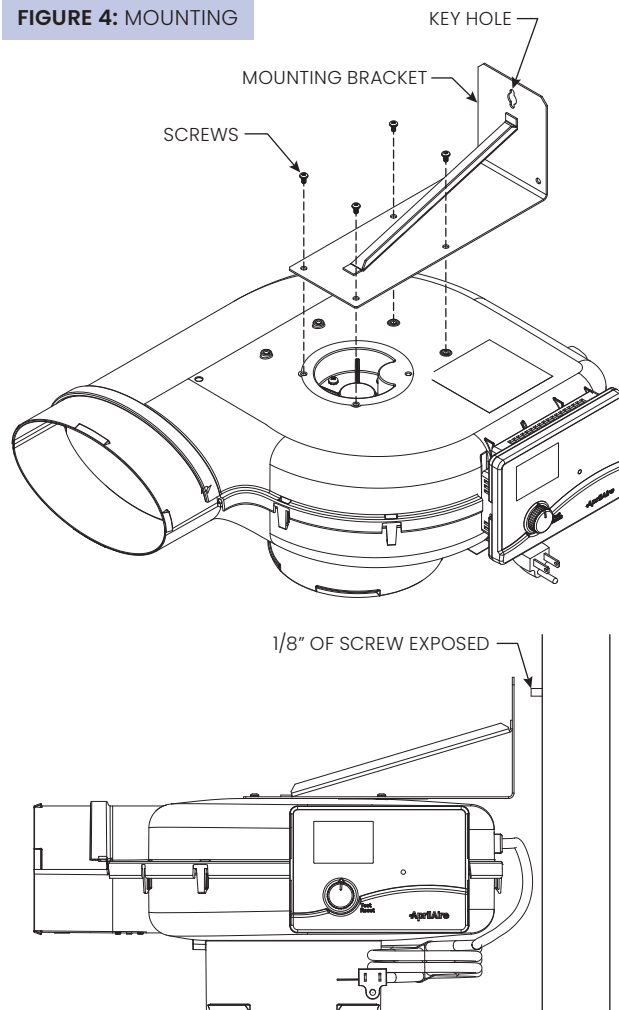


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## MOUNT THE VENTILATOR

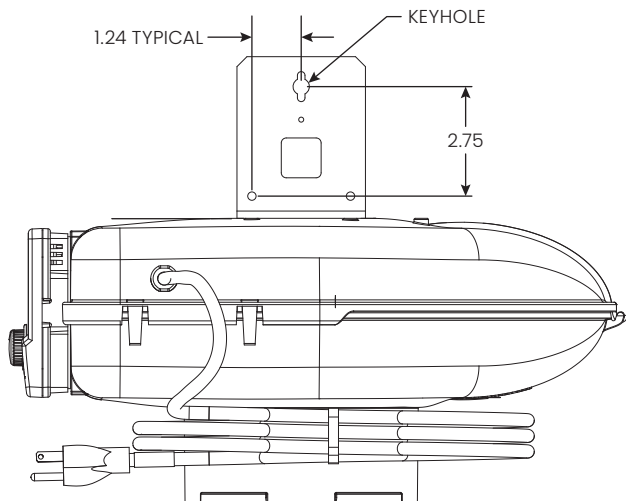
1. Attach the mounting bracket to ventilator using the (4) provided screws. See **FIGURE 4**. Ensure screws are snug, do not over tighten. **NOTE:** Using screws other than those provided may result in product damage.
2. Drive (1) screw, field provided, into the truss member or other appropriate surface 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**.

**FIGURE 4: MOUNTING**



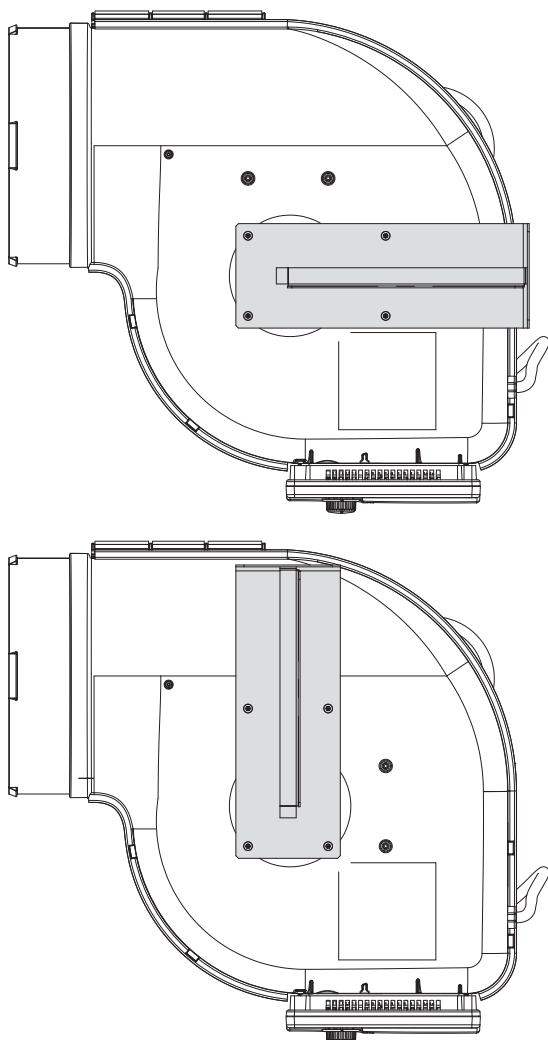
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**FIGURE 5: MOUNTING BRACKET (INCHES)**



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**FIGURE 6: MOUNTING BRACKET ORIENTATIONS**



90-02843

## MOUNT INTAKE HOOD

Install a weather tight hood with a bird screen.

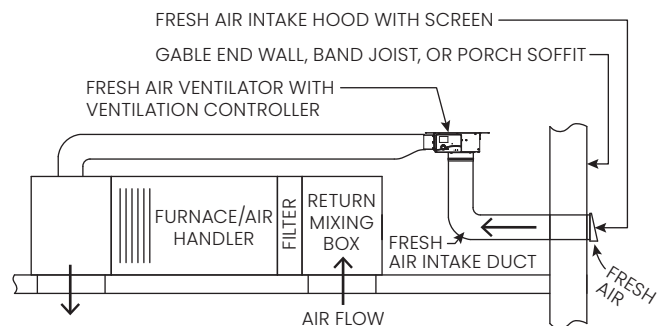
Cut a hole in the exterior wall that is large enough to fit 6" insulated flexible duct through with minimal compression of the insulation. Pull the duct through the hole and attach the flex duct to the collar of the hood. Use good quality duct tape or a plastic zip-tie to secure the duct to the collar.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

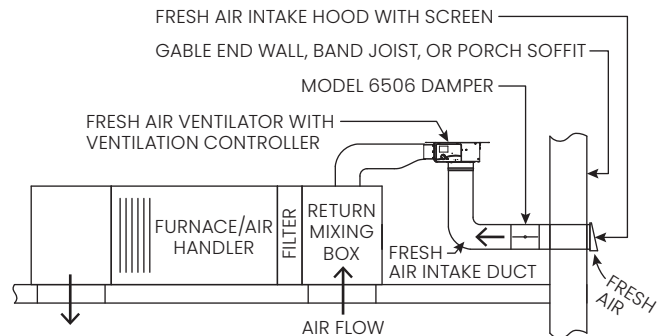
Press the hood against the outside wall and secure in place with screws; seal around the perimeter of the hood with caulk.

**FIGURE 7: TYPICAL ATTIC INSTALLATION – FRESH AIR VENTILATOR DUCTED TO SUPPLY**



90-2000

**FIGURE 8: TYPICAL ATTIC INSTALLATION – FRESH AIR VENTILATOR DUCTED TO RETURN**



90-2000

## 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.

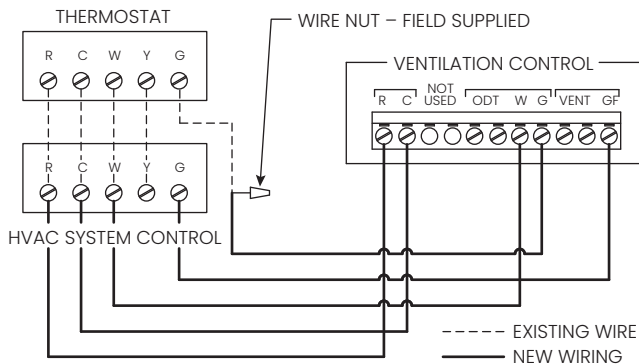
**NOTE:** Ensure the duct covers all 4 retaining tabs on each duct collar and enough of the collars remain exposed for proper tape adhesion.

## WIRING

The ventilator will turn on when the HVAC equipment is running to distribute the fresh air to the home. When ventilation is needed but the HVAC system is not running, the ventilator can turn on the HVAC system blower.

Run a 5-wire thermostat cable from the ventilator to the HVAC system control. Disconnect power to the HVAC system prior to wiring to the HVAC system controls. Select the wiring diagram below appropriate for your application (**FIGURES 9 and 10**) – leave pre-installed wires in the ventilation control (yellow and black wires) unless instructed otherwise. If the ventilator is discharging to the return side of the HVAC system as shown in **FIGURE 8** on page 4, install a transformer to power the added Model 6506 damper and wire as shown in **FIGURE 11**.

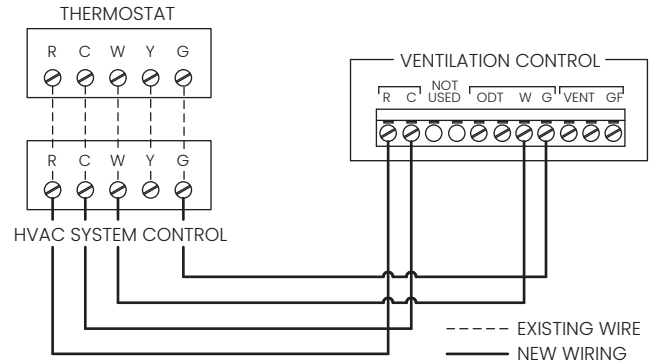
**FIGURE 9: PREFERRED – VENTILATOR TURNS ON HVAC SYSTEM BLOWER AS NEEDED**



**DO NOT REMOVE THE PRE-INSTALLED YELLOW WIRES WHEN WIRING TO THE HVAC SYSTEM.**

90-2001

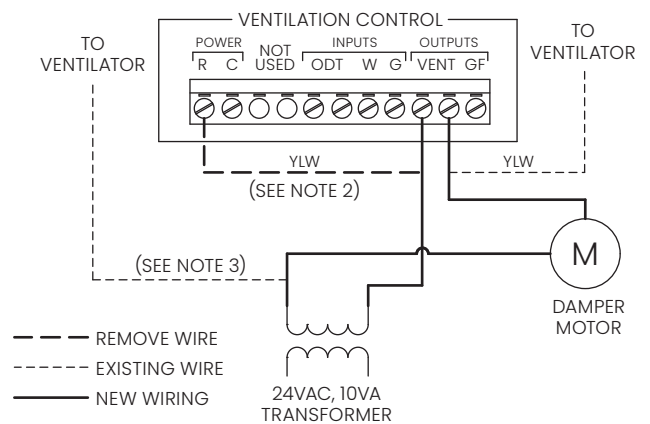
**FIGURE 10: ALTERNATE – VENTILATOR DOES NOT TURN ON THE HVAC SYSTEM BLOWER**



**DO NOT REMOVE THE PRE-INSTALLED YELLOW WIRES WHEN WIRING TO THE HVAC SYSTEM.**

90-2001

**FIGURE 11: OPTIONAL WIRING TO DAMPER IF DISCHARGING FRESH AIR TO RETURN SIDE OF HVAC**



1. Install a 24VAC, 10VA (minimum) transformer and wire the primary side to line voltage.
2. Remove the pre-installed yellow jumper wire between the **R** and **VENT** terminals.
3. Disconnect the pre-installed yellow wire from the Ventilation Control **C** terminal and wire it to the transformer as shown.
4. Wire the damper motor to the transformer and **VENT** terminal as shown.

**DO NOT REMOVE THE PRE-INSTALLED WIRES FROM THE VENTILATOR.**

90-2001

## SET UP

The control can be set up to prevent ventilation during the hottest or coldest periods of the day. When the outdoor temperature exceeds the high value or falls below the low value, ventilation will stop and additional ventilation will be brought in at a later time. See **START UP AND SEQUENCE OF OPERATION** for details.

1. Turn the vent time setting knob to **OFF**.
2. Remove the knob then remove the cover to adjust the high/low temperature limit.
3. Use a small flat head screwdriver to turn the potentiometer to select:

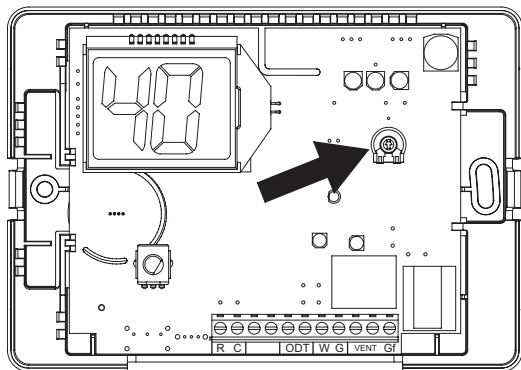
**A:** No limit, time only

**B:** 105°F high limit, 20°F low limit

**C:** 100°F high limit, 30°F low limit

**D:** 95°F high limit, 40°F low limit

**FIGURE 12: SETTING TEMPERATURE**



90-2005

## TEST

After all ducting and wiring is complete, plug in the ventilator, restore power to the HVAC system and make sure the switch controlling the outlet into which the ventilator is plugged is turned on. Turn the thermostat to the OFF mode to ensure that wiring the HVAC system has been done correctly. Rotate the Vent Time setting knob to **Test/Reset**:

1. The display will show --, the green **Active Ventilation** led will blink.
2. The ventilator blower will start.
3. If the ventilator was properly wired to turn on the HVAC unit blower with ventilation, the HVAC blower will turn on.
4. If a separate damper was wired to the inlet duct (ventilation air discharges to the return side of the HVAC system), the damper will open.
5. After one minute the test will end and the display will blink and show the firmware revision level. Return the knob to the OFF position until the desired **Time Setting** is determined.

## DETERMINE VENTILATION TIME SETTING

### CALCULATING AIRFLOW REQUIREMENT

1. The MINIMUM ventilation requirement is calculated using ASHRAE 62.2 2010.

$$\text{ASHRAE Airflow in CFM} = [\text{House Area in Sq. Ft.} \times 0.01] + [(\text{Number of Bedrooms} + 1) \times 7.5]$$

**NOTE:** Use **Number of Bedrooms + 1** or **Number of Occupants**, whichever is larger.

2. **TABLE 2** shows the calculated airflow values to the nearest 5 CFM.

3. Record the required CFM. \_\_\_\_\_

**TABLE 2: CFM REQUIRED**

House Square Feet	Number of Bedrooms					
	2	3	4	5	6	7
1000	35	40	50	55	65	70
1500	40	45	55	60	70	75
2000	45	50	60	65	75	80
2500	50	55	65	70	80	85
3000	55	60	70	75	85	90
3500	60	65	75	80	90	95
4000	65	70	80	85	95	100
4500	70	75	85	90	100	105
5000	75	80	90	95	105	110

## 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. H<sub>2</sub>O") 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 13**.
3. Turn on the ventilator by turning the dial on the control clockwise to **60**.

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:  $CFM = \text{Lower Value} + [(\text{Higher Value} - \text{Lower Value}) * 10 * (\text{Pressure Reading} - \text{Lower Value Pressure})]$ . The following is an example:

a. Measured Pressure Reading is 0.34" w.c.

b. **TABLE 3** lists 230 CFM @ 0.3" w.c. and 220 @ 0.4" w.c.

c. Either use 220 CFM or interpolate:

$$CFM = 230 - [(230-220) * 10 * (0.34-0.3)] = 230 - [(10) * 10 * (0.04)] = 230 - 4 = 226 \text{ CFM}$$

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

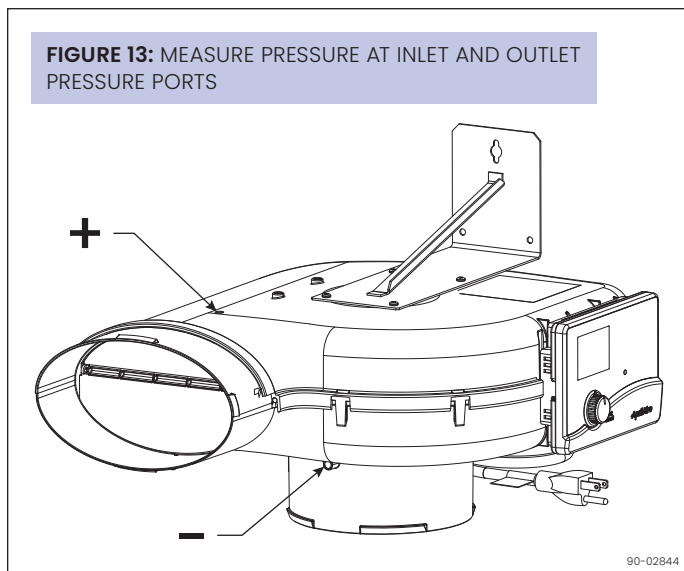


TABLE 3: DELIVERED AIRFLOW RATES	
Measured Pressure ("w.c.)	Delivered Airflow (CFM)
0.1	250
0.2	240
0.3	230
0.4	220
0.5	210
0.6	195
0.7	180
0.8	165
0.9	150
1.0	135
1.1	115
1.2	95
1.3	75
1.4	55
1.5	30

TABLE 4: CYCLE TIME SETTING (MINUTES) FOR AIRFLOW DELIVERED VS. AIRFLOW REQUIRED FOR 1 HOUR CYCLE										
CFM Delivered	CFM Required									
	20	30	40	50	60	70	80	90	100	110
60	20	30	40	50	60					
80	15	25	30	40	45	55	60			
100	15	20	25	30	35	40	50	55	60	
120	15	15	20	25	30	35	40	45	50	55
140	15	15	15	20	25	30	35	40	45	50
160	15	15	15	20	25	25	30	35	40	45
180	15	15	15	20	20	25	30	30	35	40
200	15	15	15	15	20	25	25	30	30	35
220	15	15	15	15	20	20	20	25	30	30

## START UP AND SEQUENCE OF OPERATION

Set the Ventilation Time knob to the setting that was determined in the previous section. The ventilator will turn on with the HVAC equipment for the set number of minutes during the one-hour cycle period. If the HVAC equipment does not turn on enough, the ventilator will turn on, and will turn on the HVAC system blower if wired to do so, at the end of the one-hour cycle period to ensure the desired ventilation time is met. The first time it turns on, it will stay on for five minutes to get an accurate air temperature measurement. If the air temperature is within the range that is set (see **SET UP**), the ventilator will turn on for the amount of time selected within the one-hour cycle period.

If the air temperature is outside of the set range, then no additional ventilation will occur for another hour, 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 first time the ventilator came on it measured an air temperature above the high limit setting, it would turn off after five minutes. The control will automatically change the cycle period to four hours and work to provide the additional 95 total minutes of ventilation (25 min/hr \* 4 hours = 100 minutes, minus the five minutes of the first air sampling) 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. 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.



## TROUBLESHOOTING

**TABLE 4: TROUBLESHOOTING GUIDE**

Symptom	Possible Reason	Correction
<b>Ventilator and display on control does not turn on.</b>	No power to the control.	<ul style="list-style-type: none"> <li>• Wire the control to the HVAC system as shown in the wiring diagrams on page 5.</li> <li>• Turn on power to the HVAC system.</li> </ul>
<b>Ventilator does not turn on, but display on control is on.</b>	No power to the outlet into which the ventilator is plugged.	<ul style="list-style-type: none"> <li>• Turn on switch that controls outlet.</li> </ul>
<b>E1 shows on display.</b>	RH sensor error.	<ul style="list-style-type: none"> <li>• Turn the control knob to Test/Reset position. If the error recurs, replace the control.</li> </ul>
<b>E2 shows on display.</b>	Control knob error.	<ul style="list-style-type: none"> <li>• Turn the control knob to Test/Reset position. If the error recurs, replace the control.</li> </ul>
<b>E3 shows on display.</b>	Outdoor temperature sensor failure.	<ul style="list-style-type: none"> <li>• Make sure both black wires of the sensor are connected to the ODT terminals.</li> <li>• If connected, disconnect and measure the resistance across the black wires. If it is open or shorted, replace sensor.</li> </ul>
<b>Air is blowing out of the intake hood.</b>	Backdraft damper is open.	<ul style="list-style-type: none"> <li>• Make sure the unit is mounted in the proper orientation – outlet cannot point down.</li> <li>• Remove the backdraft damper and rotate it 180° so that it closes when the ventilator turns off.</li> </ul>
<b>"r#" (where # is a number) shows on the display.</b>	Left in test mode.	<ul style="list-style-type: none"> <li>• Turn knob to time setting.</li> </ul>

## 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, lightning 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 APRILAIRE 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 [aprilair.com/warranty](https://aprilair.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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