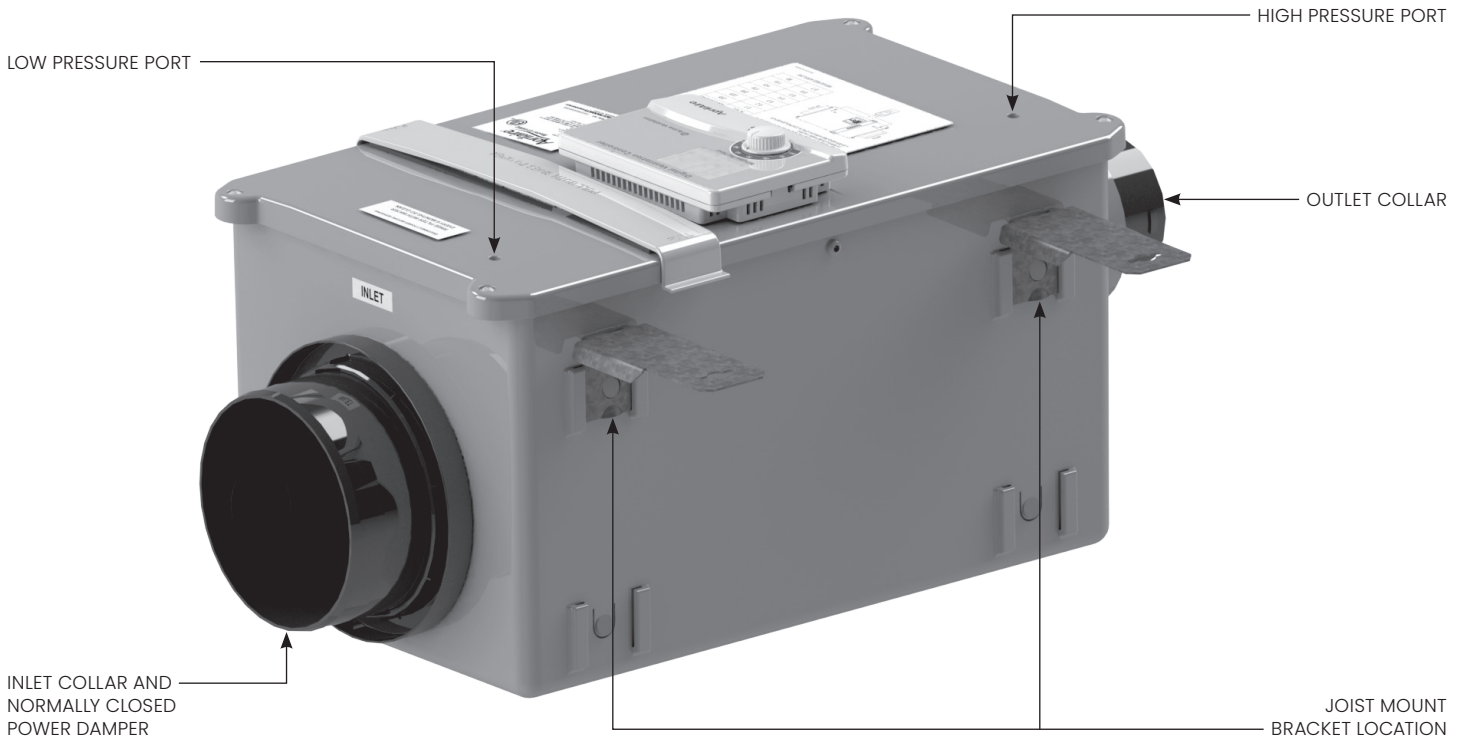
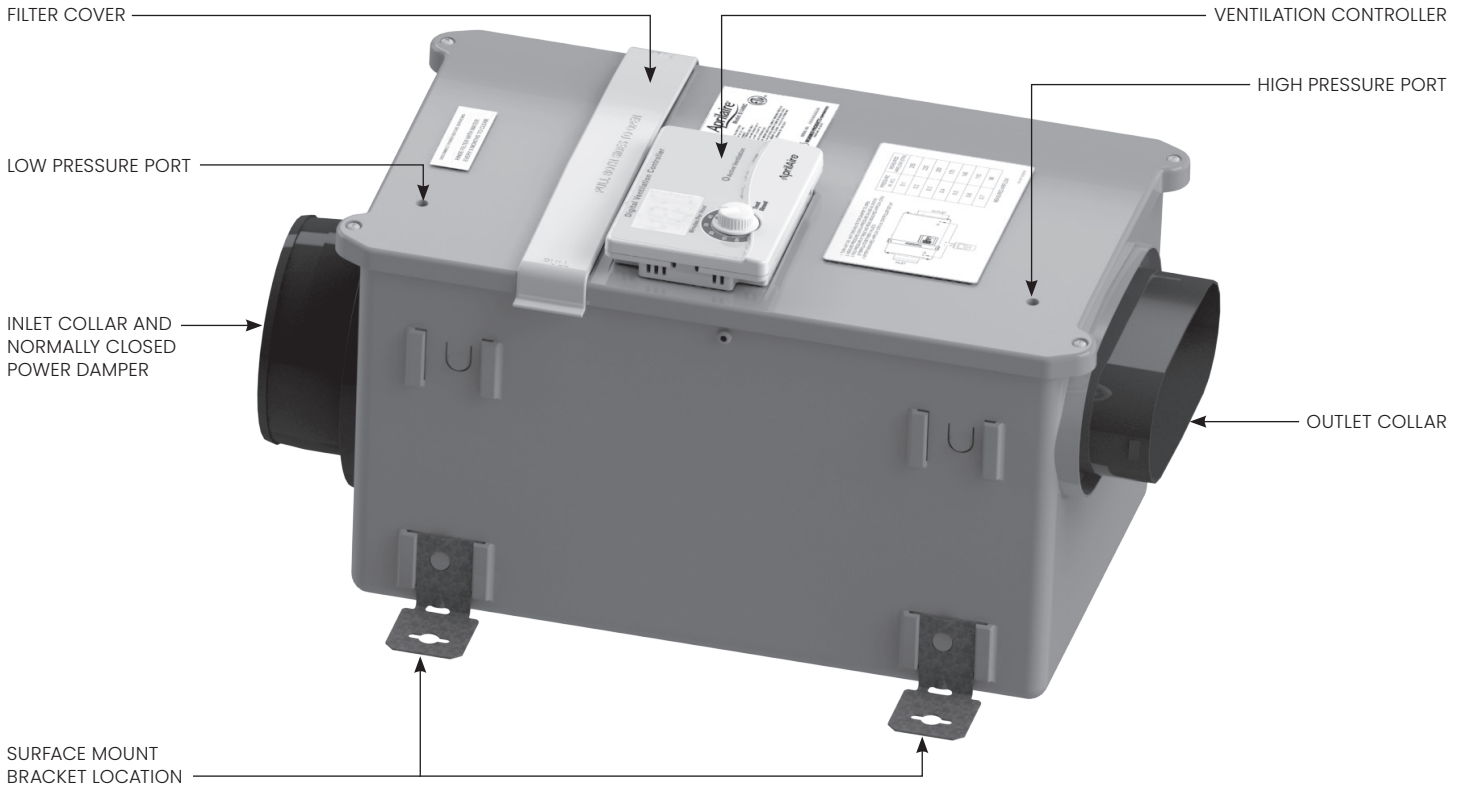


AprilAire® Ventilation

INSTALLATION & OPERATING INSTRUCTIONS



Model 8145A Fresh Air Ventilator



READ AND SAVE THESE INSTRUCTIONS

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SAFETY INSTRUCTIONS

WARNING

1. 120 Volts may cause serious injury from electric shock. Disconnect electrical power before starting installation or servicing. Leave power disconnected until installation/service is completed.
2. Sharp edges may cause serious injury from cuts. Use care when cutting plenum openings and handling duct work.

CAUTION

1. Read all instructions before beginning installation.
2. Improper installation may cause property damage or injury. Installation, service, and maintenance must be performed by a qualified service technician.

INTRODUCTION AND COMPLIANCE STATEMENT

The Model 8145A 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, then simply plug the unit in, set the amount of needed ventilation and select the desired temperature limits.

When properly installed and set, the Model 8145A Fresh Air Ventilator will meet the mechanical ventilation requirements of:

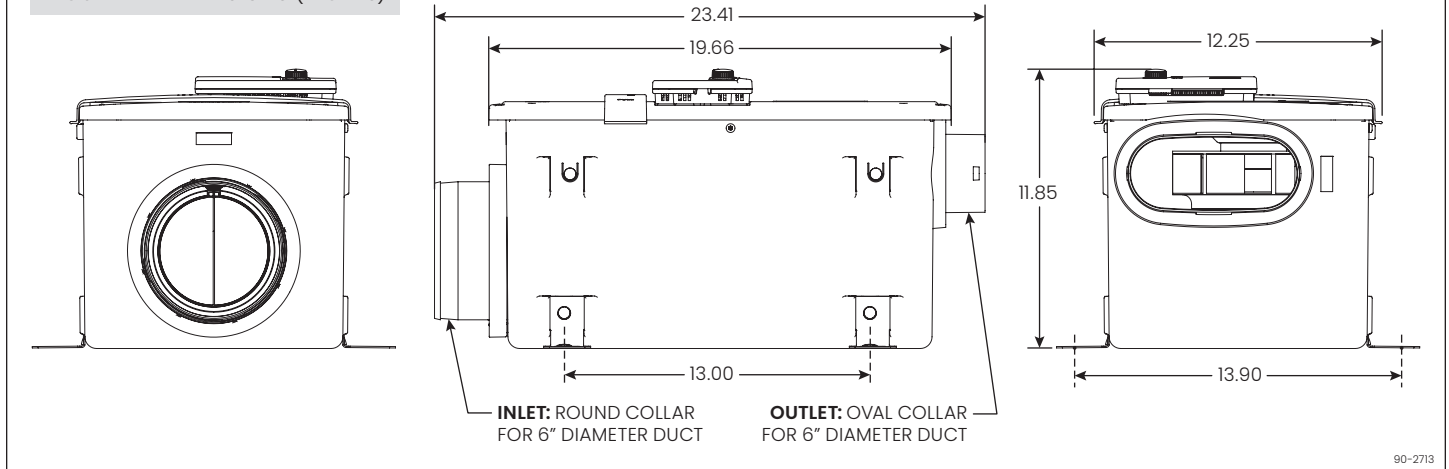
- Energy Star Certified Homes
- EPA Indoor airPLUS
- 2012-2018 International Residential Code (IRC)
- 2012-2018 International Energy Conservation Code (IECC)
- California Energy Commission Title 24
- ASHRAE Standard 62.2-2010
- ASHRAE Standard 62.2-2013 & 2016

SPECIFICATIONS

TABLE 1 – SPECIFICATIONS

External Static Pressure ("w.c.)	Airflow (CFM)	Efficacy (CFM/watt)	Voltage
0.0	210	5.2	120 VAC 1 phase 60 Hz
0.2	180	4.4	
0.4	150	3.5	
0.6	120	2.8	

FIGURE 1 – DIMENSIONS (INCHES)



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INSTALL ELECTRICAL OUTLET

Install a standard NEMA 5-15 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 3-prong plug.

VENTILATOR LOCATION AND ORIENTATION

If the outlet of the ventilator is not ducted, or if small sections of collapsible duct (i.e. flex duct) are attached to the outlet, then the ventilator must be mounted in a location which minimizes interference with moving parts (see **CAUTIONS** below).

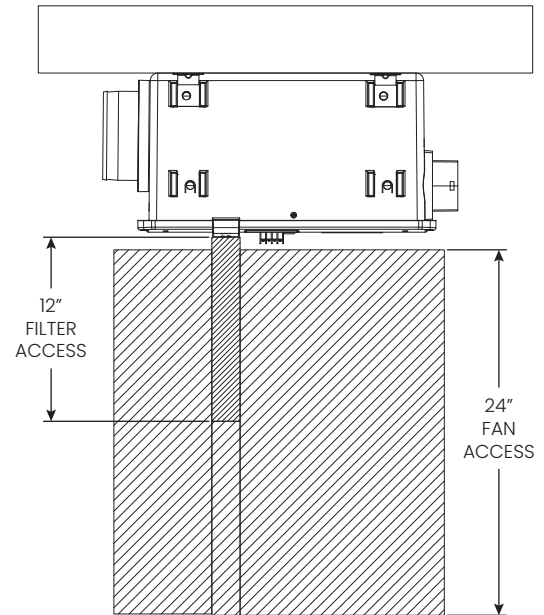
⚠ CAUTION

1. Mount the blower with the lowest, exposed moving parts at least 8 feet (2.4 m) above floor or grade level.
2. Mount the blower at least 3.3 feet (1.0 m) from any accessible opening of the duct.

Choose a location for the ventilator that is within 6 feet of the outlet into which the ventilator will be plugged. Allow space for filter removal and service as shown in **FIGURE 2**.

The ventilator can be mounted in any orientation.

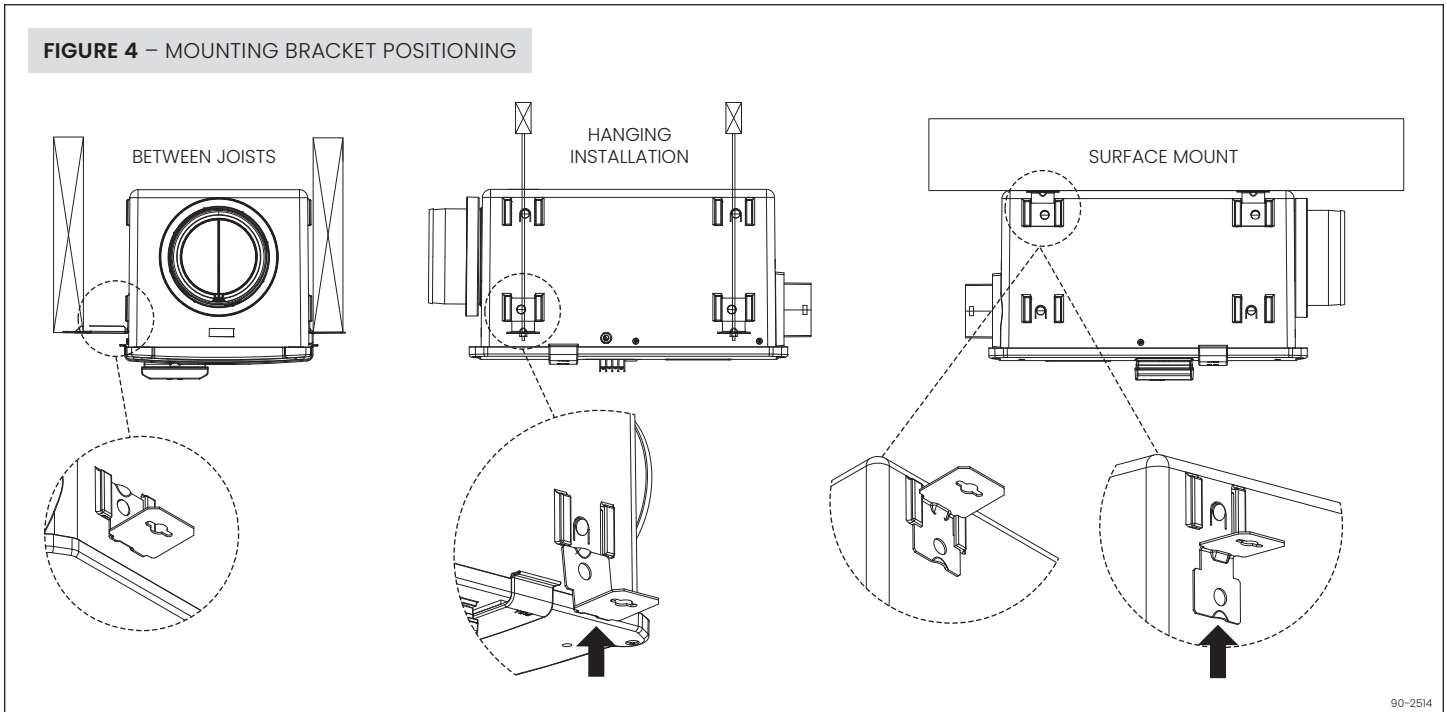
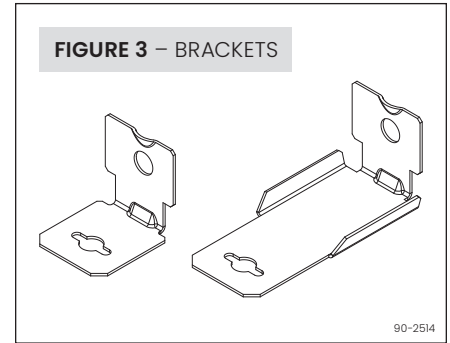
FIGURE 2 – CLEARANCES FOR SERVICING



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MOUNT THE VENTILATOR

1. Select the appropriate brackets, large or small, for mounting the ventilator (see **FIGURE 3**). **If mounting to the wall or hanging from joists**, use the four small mounting brackets. **If mounting on or in between the floor joists**, install all four smaller brackets for 13" on center joists, or two small and two longer brackets for 16" on center joists.
2. Snap the brackets into the proper locations as shown in **FIGURE 4**. Use the mounting locations nearest the cover for mounting between floor joists or hanging from rafters. Use the mounting locations near the bottom of the unit for surface mounting (i.e. to a flat wall, ceiling surface or bottom of joists).
3. Screw the ventilator brackets into joists or a strong platform using the #10 x 3/4" screws provided. The ventilator weighs approximately 15 pounds, so do not secure into drywall alone.



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 metal foil 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.

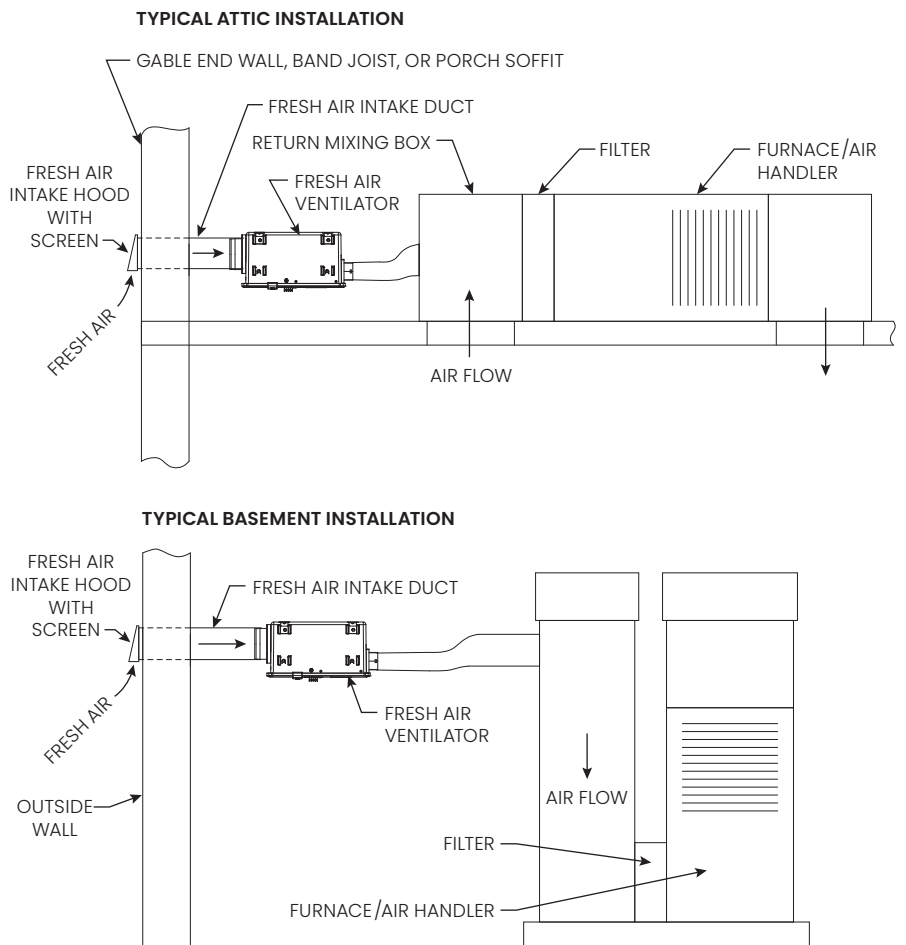
Press the hood against the outside wall and secure in place with screws; seal around the perimeter of the hood with caulk.

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 HVAC system. Duct the outlet of the ventilator to the **return side** of the HVAC system (refer to **FIGURE 5**).

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.

FIGURE 5 – DUCTING IN UPFLOW AND HORIZONTAL HVAC SYSTEMS



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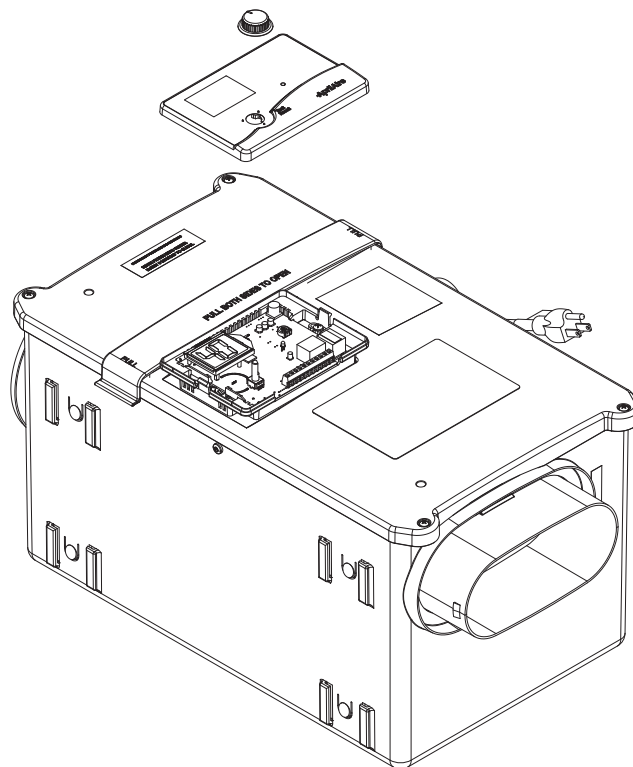
WIRING THE CONTROL TO THE HVAC SYSTEM

NOTICE

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

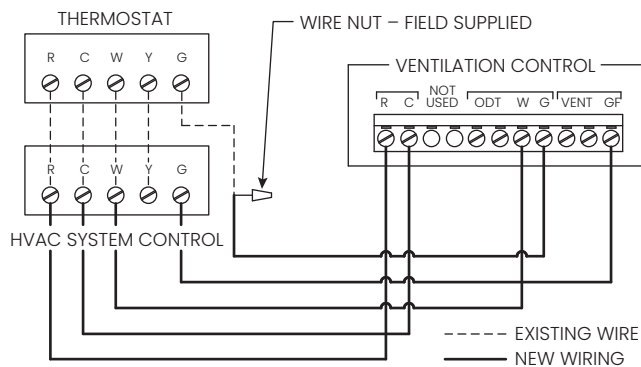
1. Remove the control knob and cover as shown in **FIGURE 6**. Set aside in a safe place until all wiring has been completed.
2. Run a 4 or 5 conductor cable between the control and the HVAC system.
3. Wire to the HVAC system in accordance with **FIGURE 7** or **FIGURE 8**.

FIGURE 6 – REMOVE CONTROL KNOB AND COVER



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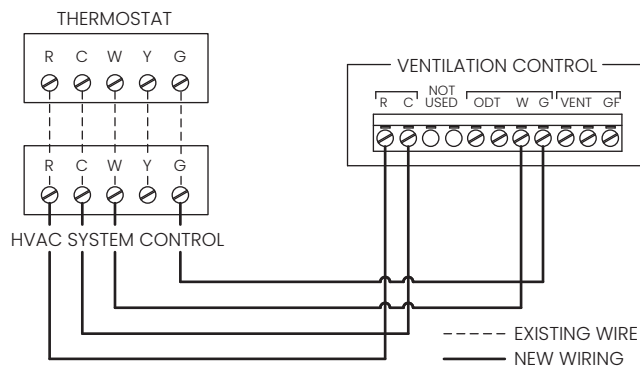
FIGURE 7 – PREFERRED – VENTILATOR TURNS ON THE HVAC SYSTEM BLOWER AS NEEDED



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

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FIGURE 8 – ALTERNATE – VENTILATOR DOES NOT TURN ON THE HVAC SYSTEM BLOWER



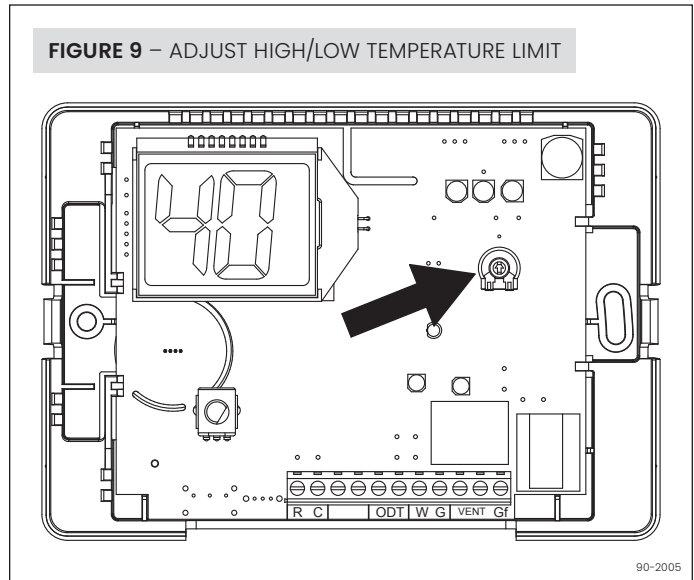
DO NOT REMOVE THE PRE-INSTALLED YELLOW OR BLACK WIRES WHEN WIRING TO THE HVAC SYSTEM.

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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



TEST

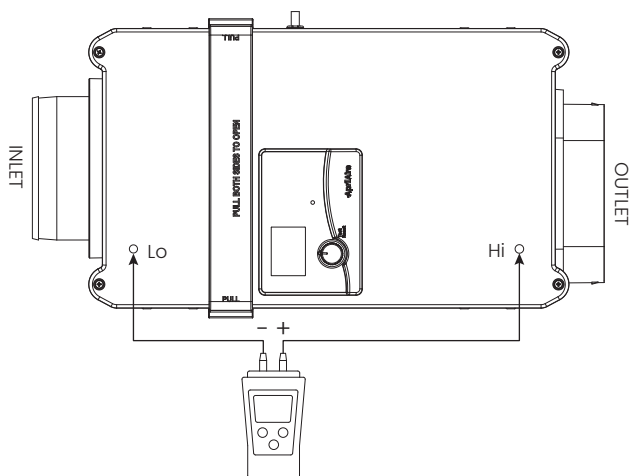
After all ducting and wiring is complete, plug in the ventilator, restore power to the HVAC system and make sure the switch controlling the outlet into which the ventilator is plugged is turned on. Turn the thermostat to the OFF mode to ensure that wiring the HVAC system has been done correctly. Rotate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

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 10**.
3. Turn on the ventilator by turning the control knob to 60.
4. Use the label on the cover of the ventilator, or **TABLE 2**, 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" w.c.
 - b. **TABLE 2** lists 200 CFM @ 0.3" w.c. and 170 @ 0.4" w.c.
 - c. Either use 170 CFM or interpolate:
 $CFM = 200 - [(200-170) * 10 * (0.34-0.3)] = 200 - [(30) * 10 * (0.04)] = 200 - 12 = 188 CFM$
 Interpolating will demonstrate higher delivered airflow, but requires a calculation to be done.

FIGURE 10 – MEASURE PRESSURE AT INLET AND OUTLET PRESSURE PORTS



90-2719

TABLE 2 – DELIVERED AIRFLOW CORRESPONDING TO MEASURED PRESSURE AT VENTILATOR PRESSURE PORTS

Measured Pressure ("w.c.)	Delivered Airflow (CFM)
0.1	255
0.2	225
0.3	200
0.4	170
0.5	145
0.6	115
0.7	90

DETERMINE VENTILATION TIME SETTING

CALCULATING AIRFLOW REQUIREMENT

- 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.

- TABLE 3** shows the calculated airflow values to the nearest 5 CFM.
- Record the required CFM. _____

TABLE 3 – CFM REQUIRED

House Sq. Ft.	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 VENTILATION AIR (CFM) DELIVERY RATE AND SELECT VENT TIME

- Measure the outdoor air flow (CFM) through the duct that is bringing in only outdoor air.
- Use the CFM Delivered along with the CFM required to find the Cycle Time per hour setting from **TABLE 4**. For example if the ventilator is providing 120 CFM, and the requirement is 70 CFM, set the time to 35 minutes.
- Use the control knob to set the vent time to the determined minutes per hour. **NOTE:** knob can be set halfway between printed numbers to achieve 5 minute increments.

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 ($25 \text{ min/hr} \times 4 \text{ hours} = 100 \text{ minutes}$, minus the five minutes of the first air sampling) during the four-hour cycle period.

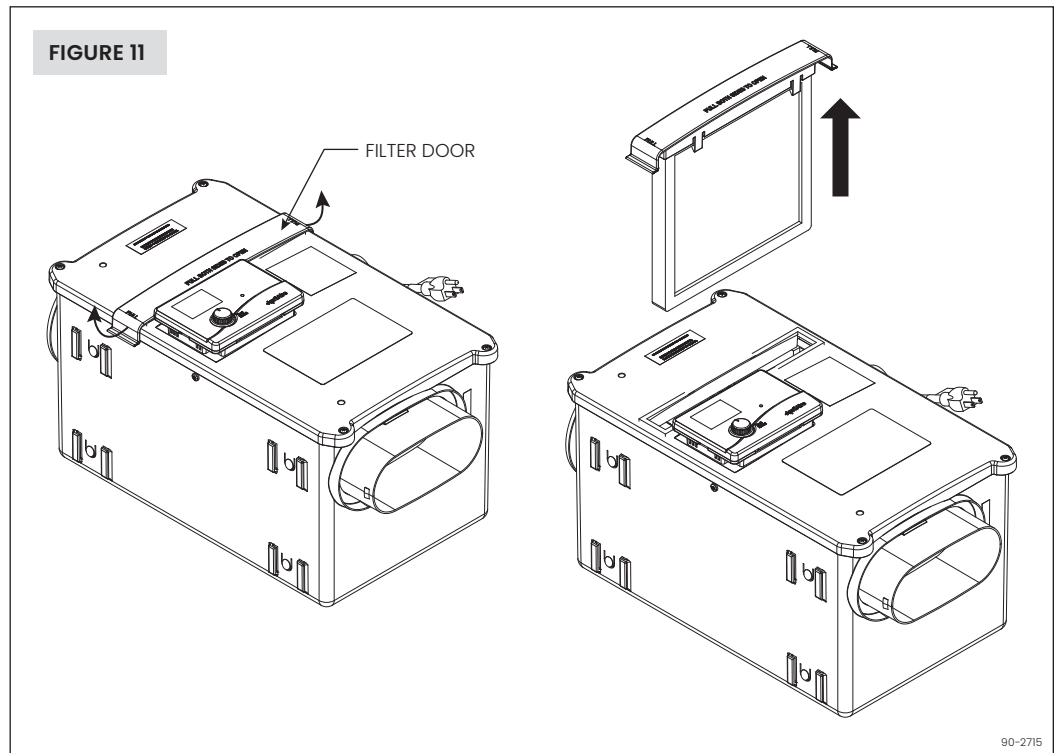
If the air temperature is still out of range, the control will automatically switch to an 8-hour cycle period, then a 12-hour cycle period and finally a 24-hour cycle period. During 8, 12 and 24 hour cycle periods, the total ventilation time increases to compensate for ventilation effectiveness as defined in ASHRAE Standard 62.2-2010. 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.

FILTER CLEANING

Normally, the fresh air filter will need to be removed and cleaned every six months, but check it after the first three months following installation to determine if more or less frequent cleaning will be necessary. After cleaning the filter inside the ventilator, clean off the screen at the fresh air intake hood on the outside of the house. The most common cause of reduced ventilation is a clogged air intake hood.

To clean the ventilator filter
(see **FIGURE 11**):

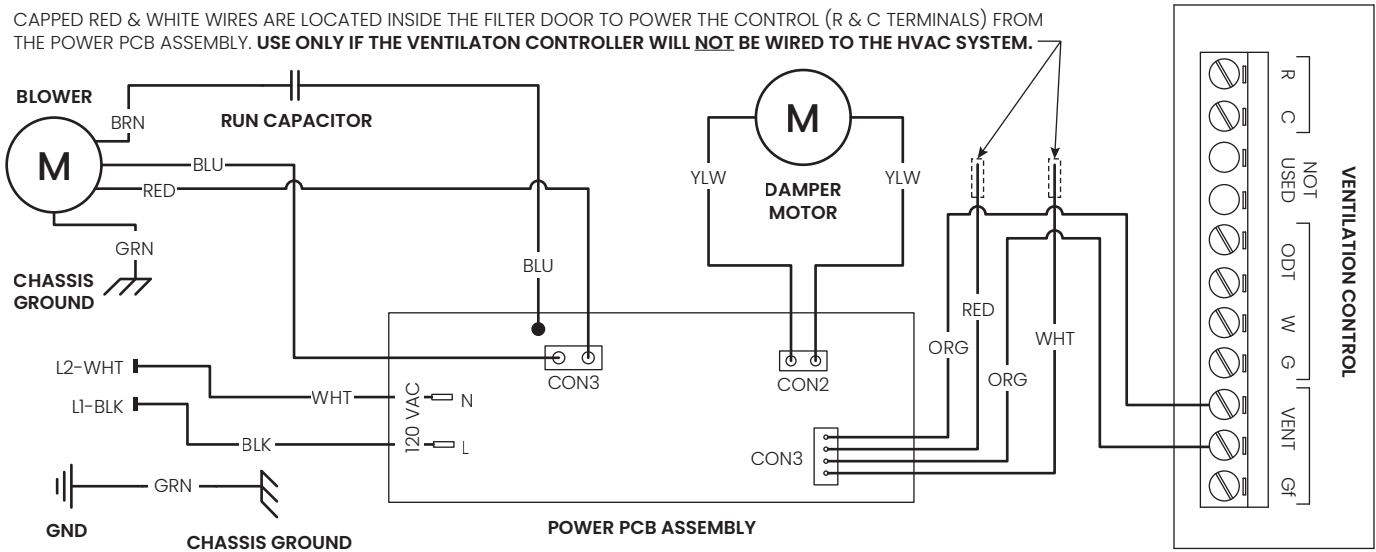
1. Flex the outside edges of the filter door to disengage it from the housing.
2. Lift the filter door to remove the filter from the ventilator.
3. Use water to rinse the filter and shake the excess moisture off the filter.
4. Replace the filter in the ventilator and press the outside edges of the filter door to snap it in place.



INTERNAL SCHEMATICS

FIGURE 12 – MODEL 8145A INTERNAL SCHEMATIC

CAPPED RED & WHITE WIRES ARE LOCATED INSIDE THE FILTER DOOR TO POWER THE CONTROL (R & C TERMINALS) FROM THE POWER PCB ASSEMBLY. **USE ONLY IF THE VENTILATION CONTROLLER WILL NOT BE WIRED TO THE HVAC SYSTEM.**



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LIMITED WARRANTY

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

AprilAire's exclusive obligation under this warranty shall be to supply, without charge, a replacement for any component which is found to be defective within such five (5) year period and which is returned not later than thirty (30) days after said five (5) year period by you to either your original supplier or to AprilAire, Madison, Wisconsin 53701, together with the model number and installation date of the ventilator.

THIS WARRANTY SHALL NOT OBLIGATE APRILAIRE FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY YOUR INSTALLER AS CONTRASTED TO DEFECTS IN THE VENTILATOR ITSELF.

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFORESAID FIVE YEAR PERIOD. APRILAIRE'S LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, OTHER THAN DAMAGES FOR PERSONAL INJURIES, RESULTING FROM ANY BREACH OF THE AFORESAID IMPLIED WARRANTIES OR THE ABOVE LIMITED WARRANTY IS EXPRESSLY EXCLUDED. THIS LIMITED WARRANTY IS VOID IF DEFECTS(S) RESULT FROM FAILURE TO HAVE THIS UNIT INSTALLED BY A QUALIFIED HEATING AND AIR CONDITIONING CONTRACTOR. IF THE LIMITED WARRANTY IS VOID DUE TO FAILURE TO USE A QUALIFIED CONTRACTOR, 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 exclusion or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WARRANTY REGISTRATION

Visit us online at aprilair.com to register your AprilAire product. If you do not have online access, please mail a postcard with your name, address, phone number, email address, product purchased, model number, date of purchase, and dealer name and address to: AprilAire, P.O. Box 1467, Madison, WI 53701.

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



MANUFACTURING
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AprilAire reserves the right to change specifications without notice.