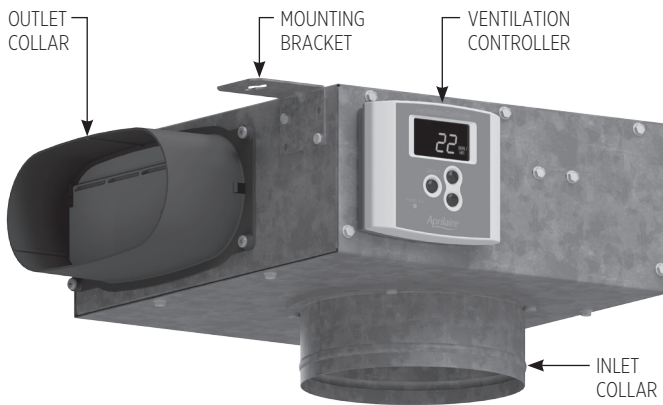


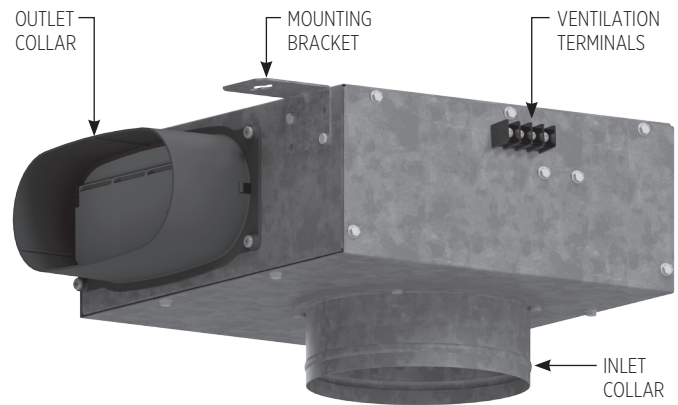
Model 8142 and 8142NC Fresh Air Ventilator Installation and Operating Instructions



MODEL 8142 FRESH AIR VENTILATOR



MODEL 8142NC FRESH AIR VENTILATOR



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.

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READ AND SAVE THESE INSTRUCTIONS

INTRODUCTION AND COMPLIANCE STATEMENT

The Aprilaire® Model 8142 and 8142NC 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 62.2-2010 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 8142 and 8142NC Fresh Air Ventilator will meet the mechanical ventilation requirements of:

- Energy Star Certified Homes, Version 3
- EPA Indoor airPLUS, Version 1
- 2012/2015 International Residential Code (IRC)
- 2012/2015 International Energy Conservation Code (IECC)
- California Energy Commission Title 24

SPECIFICATIONS

TABLE 1 – SPECIFICATIONS

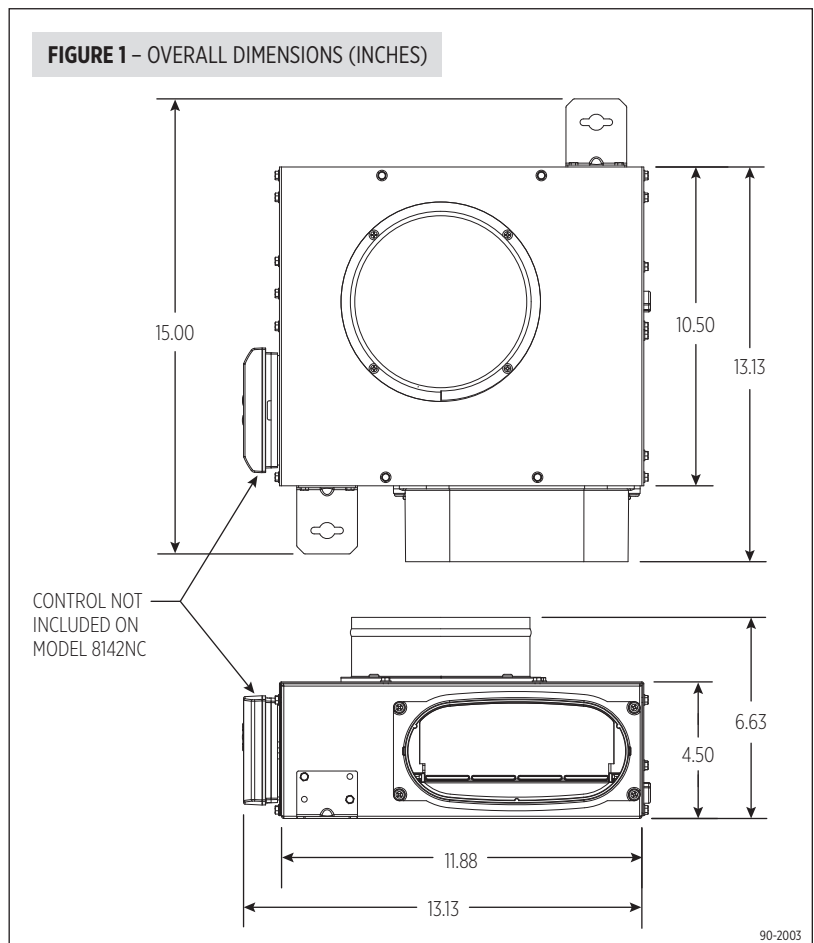
External Static Pressure* ("w.c.)	Airflow (CFM)	Current (amps)	Efficacy (CFM/watt)
0.0	245	.63	3.30
0.2	220	.64	2.96
0.4	190	.64	2.57
0.6	160	.63	2.12
0.8	120	.61	1.69
1.0	95	.60	1.35

*Measured across ventilator.

Temperature Range: 0°F–160°F

Voltage: 115 VAC, 1 phase, 60 Hz

FIGURE 1 – OVERALL DIMENSIONS (INCHES)

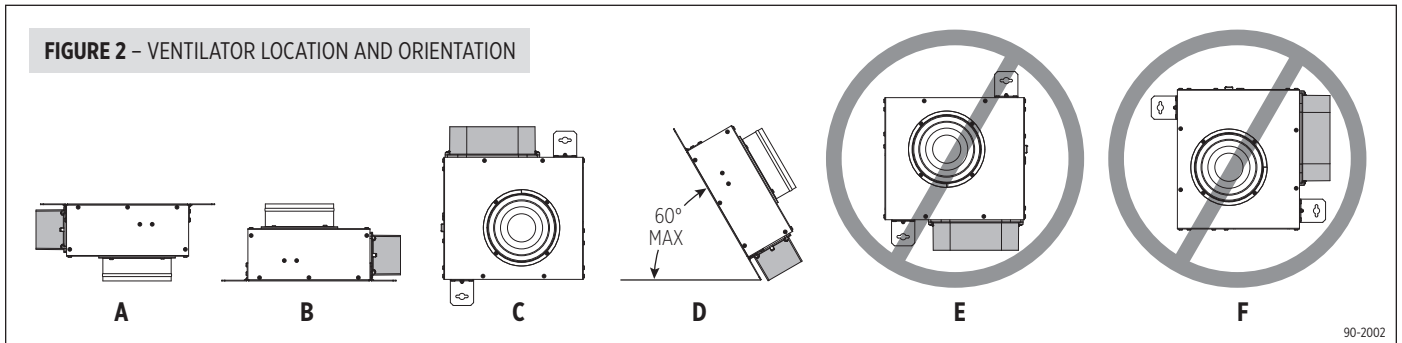


INSTALL ELECTRICAL OUTLET

Install a standard NEMA 5-15 grounded, 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 grounded plug. Locate the switch in a suitable location to allow the user to manually override the mechanical ventilation system. Use the label provided in the carton to label the switch "Mechanical Ventilation" or something similar to differentiate it from standard outlet or light switches.

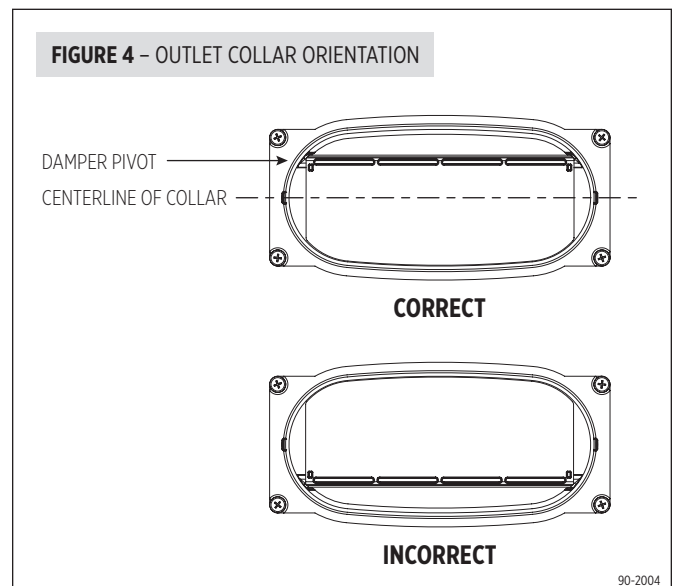
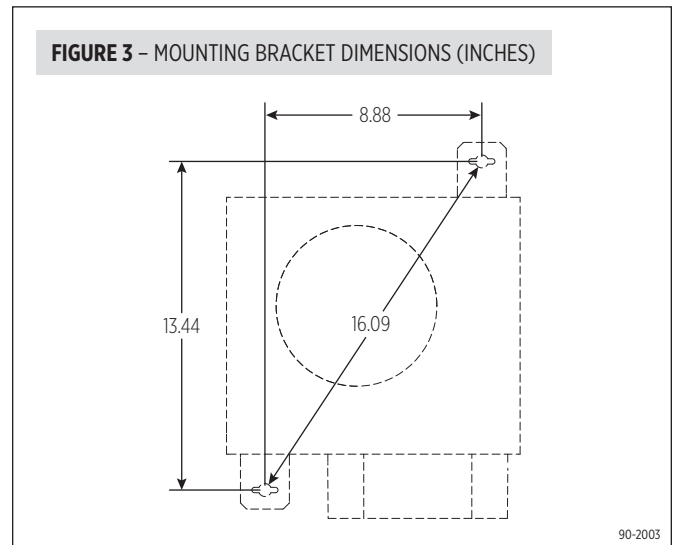
VENTILATOR LOCATION AND ORIENTATION

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.



MOUNT THE VENTILATOR

1. Position the mounting brackets as shown and install using the #8 x 1/2" sheet metal screws supplied with the brackets.
2. Locate the ventilator on a joist or platform and screw it into place using the #10 x 3/4" screws provided. See **FIGURE 3**.
3. Make sure the backdraft damper in the oval outlet collar is positioned so that it will open when the ventilator is on and will close on its own when the ventilator is off (see **FIGURE 4**). If necessary, remove the collar, rotate it 180° and reinstall.



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.

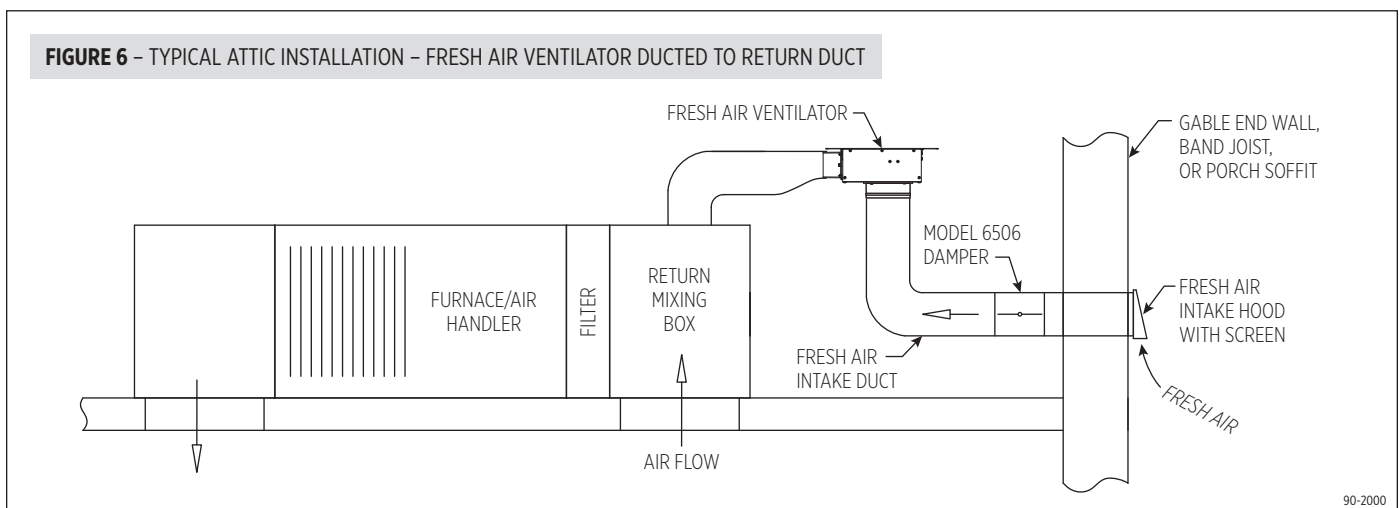
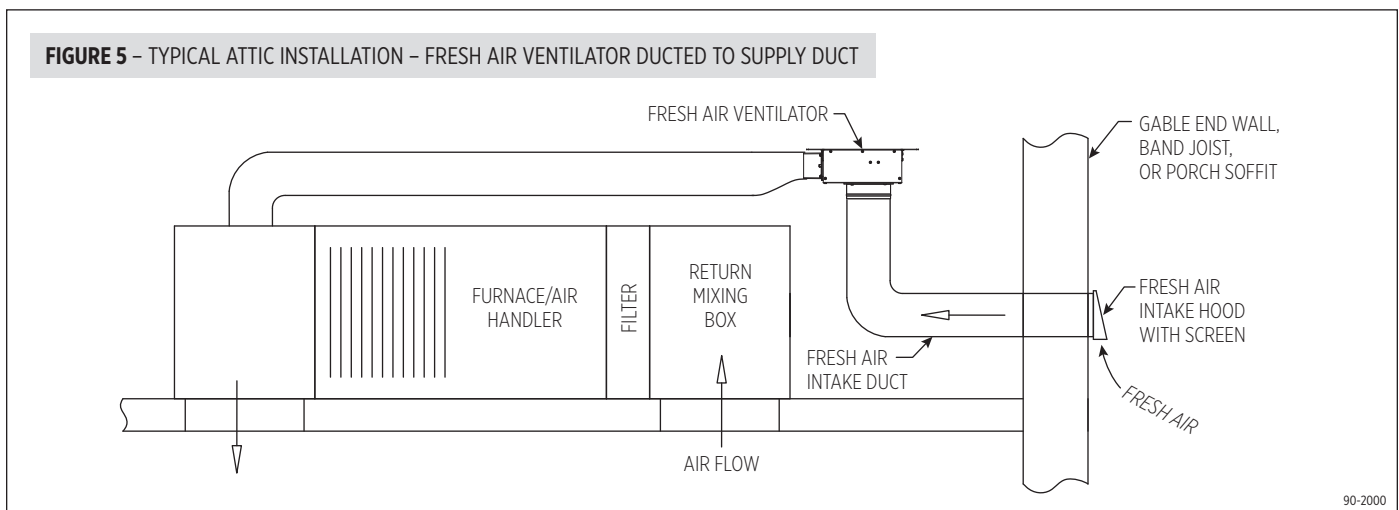
Press the hood against the outside wall and secure in place with screws; seal around the perimeter of the hood with caulk.

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 of the unit to the supply (see **FIGURE 5**) or return side (see **FIGURE 6**) of the HVAC system. In warm/dry climates, duct the outlet of the ventilator to the supply 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.
- Remove the damper from the Model 8142 or 8142NC. Simply open the damper and push on the blade to pop it out of the collar, then remove the blade.



MODEL 8142NC – WIRING TO VARIOUS CONTROLS

The Model 8142NC Fresh Air Ventilator can be wired to Aprilaire Thermostat Models 8620 or 8620W, to Aprilaire IAQ Control Models 8910, 8910W or 8920W, or to the Model 8120A or 8120X Digital Ventilation Controller. If the ventilator is ducted to the return side of the HVAC system and a separate damper is installed (see **FIGURE 6** on page 4), an additional transformer may be required if the HVAC system transformer does not have enough capacity to power a damper (10 VA required, use Aprilaire part number 4010 if needed). Select the diagram that corresponds to the control to be used and whether an additional transformer is needed for a separate damper. Wire the controls to the HVAC equipment and any other IAQ accessory in accordance with the literature provided with the control.

FIGURE 7 – WIRING TO IAQ CONTROL

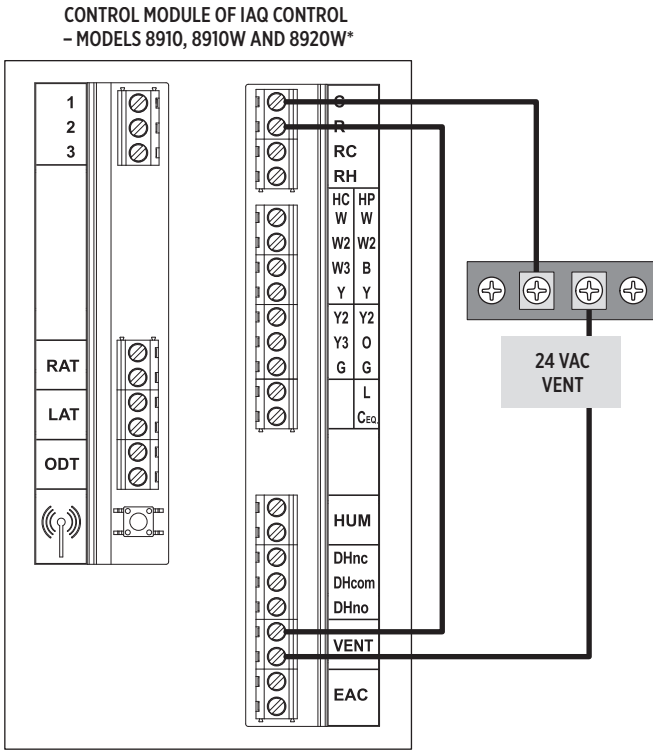


FIGURE 7A – WIRING TO IAQ CONTROL AND DAMPER

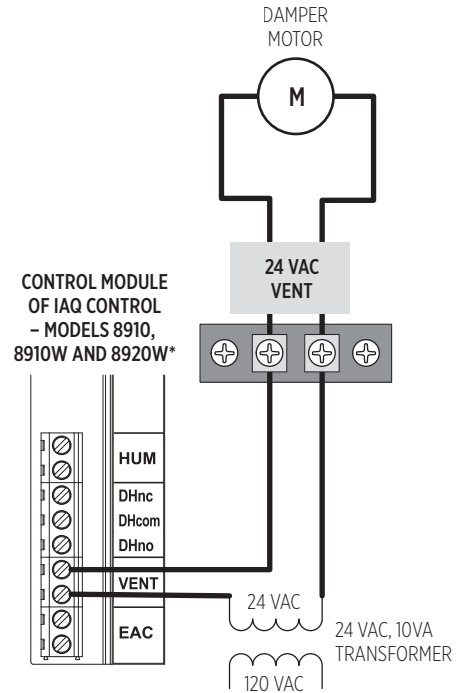


FIGURE 8 – WIRING TO THERMOSTAT

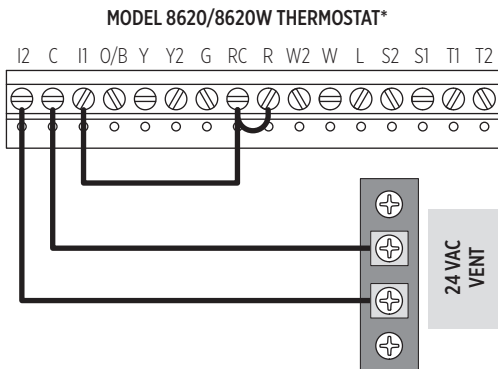
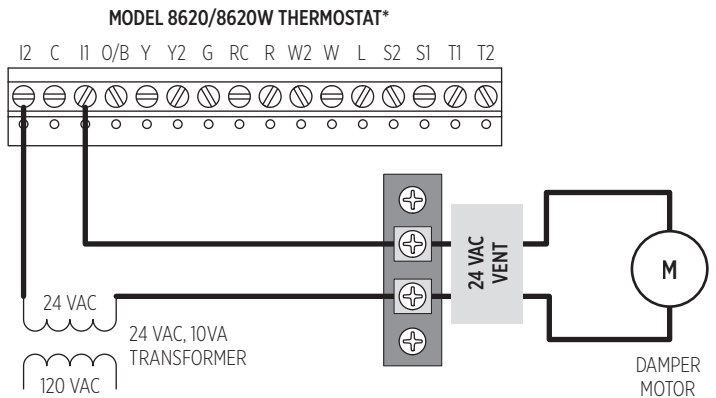


FIGURE 8A – WIRING TO THERMOSTAT AND DAMPER



*Outdoor Temperature is supplied with the control and is required for optimum ventilation control.

FIGURE 9 – WIRING TO MODEL 8120A

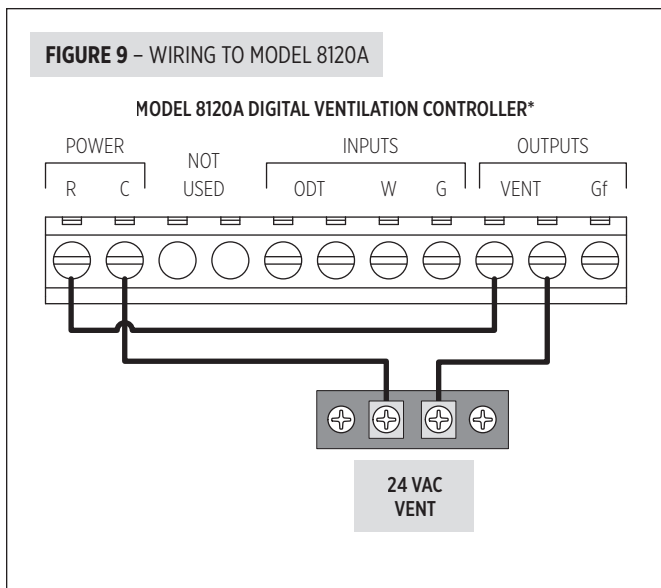


FIGURE 9A – WIRING TO MODEL 8120A AND DAMPER

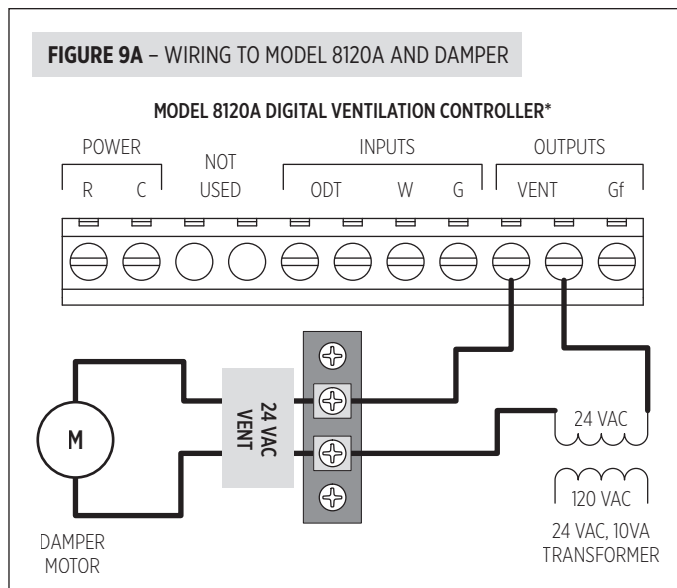


FIGURE 10 – WIRING TO MODEL 8120X

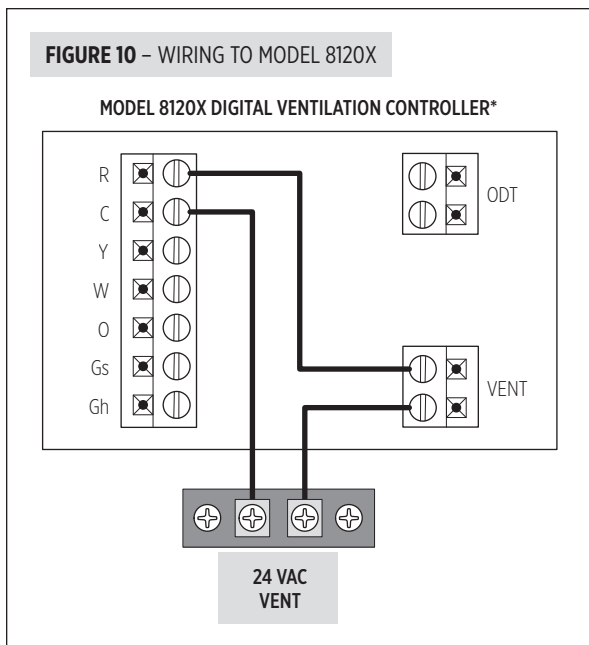
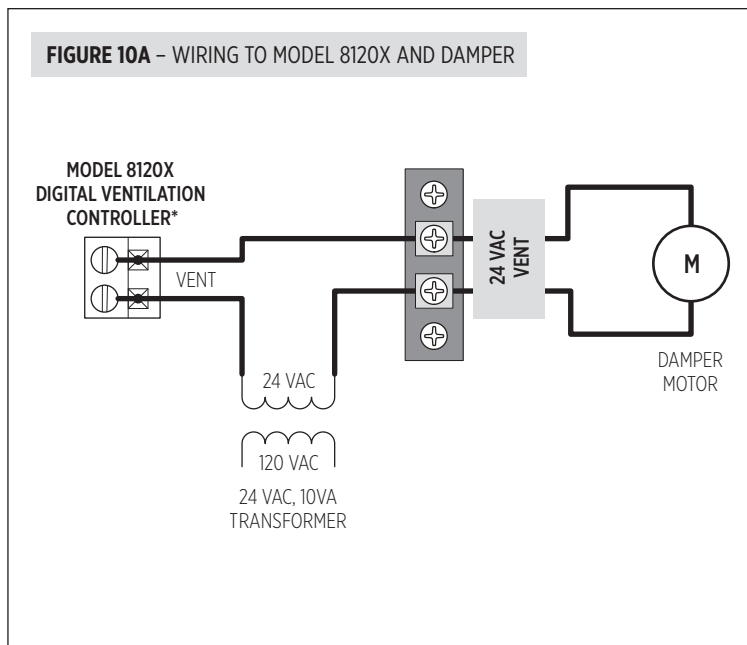


FIGURE 10A – WIRING TO MODEL 8120X AND DAMPER



*Outdoor Temperature is supplied with the control and is required for optimum ventilation control.

MODEL 8142NC – TEST MODE

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.

1. Apply 24 VAC to the **VENT** terminals of the 8142NC using the installed control.
2. The ventilator blower will start.
3. Adjust ventilation control to the desired setting.

MODEL 8142NC – SEQUENCE OF OPERATION

Refer to the installation manual provided with the control that is wired to the Model 8142NC.

MODEL 8142 – WIRING THE CONTROL TO THE HVAC SYSTEM

NOTICE

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

1. Remove the control from the mounting plate as shown in **FIGURE 11**. 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 12** if installed in a furnace/AC application or **FIGURE 13** if installed with a heat pump.

FIGURE 11 – REMOVE CONTROL FROM MOUNTING PLATE

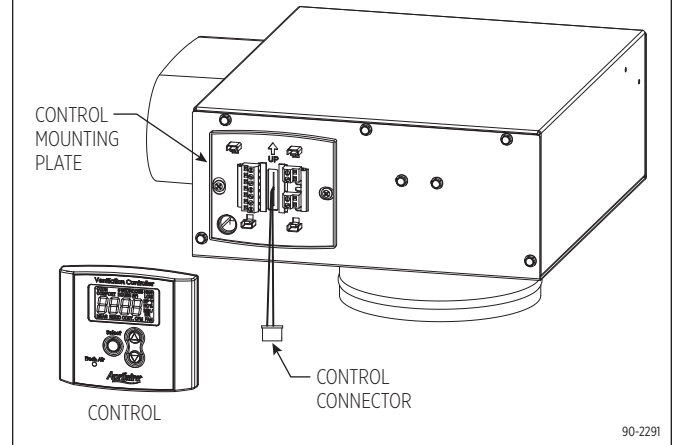


FIGURE 12 – WIRING VENTILATION CONTROL TO A FURNACE

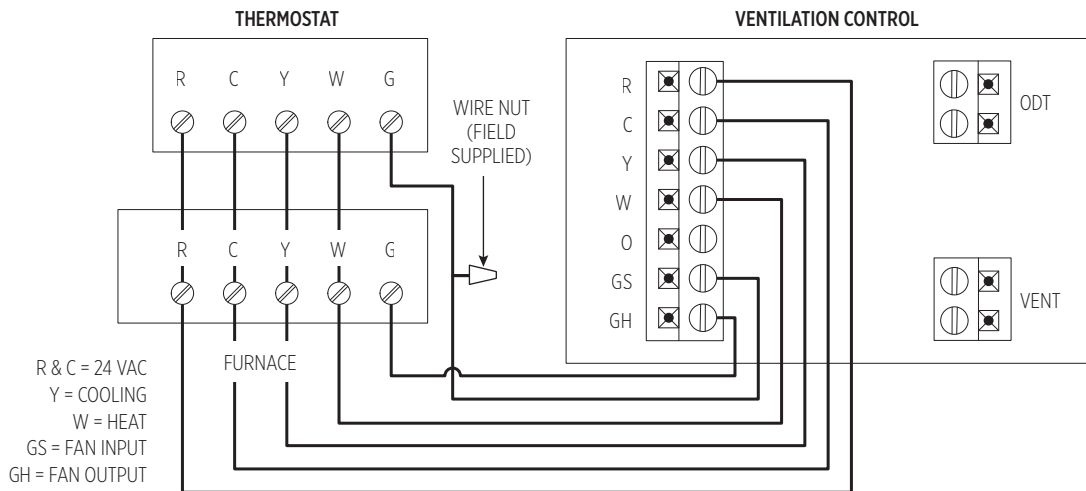
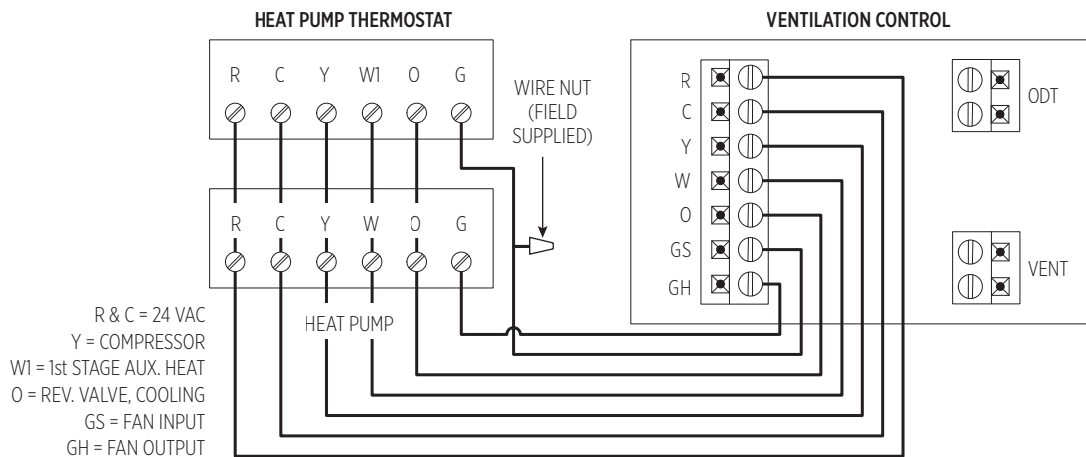


FIGURE 13 – WIRING VENTILATION CONTROL TO A HEAT PUMP



MODEL 8142 – CONNECTING THE CONTROL TO THE VENTILATOR

If the 8142 ventilator is ducted to the supply side of the HVAC system (see **FIGURE 5** on page 4), plug the Control Connector into the back of the control at the location shown in **FIGURE 14**. 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 8142 ventilator is ducted to the return side of the HVAC system and a separate damper is installed (see **FIGURE 6** on page 4), an additional transformer (Aprilaire part number 4010) may be required if the HVAC system transformer does not have enough capacity to power a damper (10 VA required).

1. Cut the plug off of the end of the control connector (see **FIGURE 11**) and strip approximately 1/4" of insulation off the end of each of the orange wires.
2. 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 15**).
3. Wire the damper motor and transformer as shown in **FIGURE 15**.
4. Restore power to the HVAC system and plug in the ventilator when complete.

FIGURE 14 – PLUG THE CONTROL INTO THE VENTILATOR

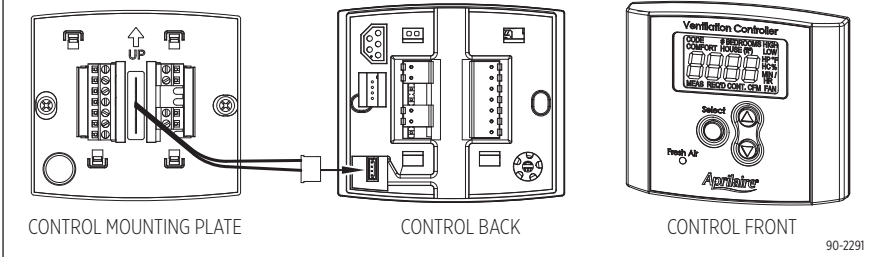
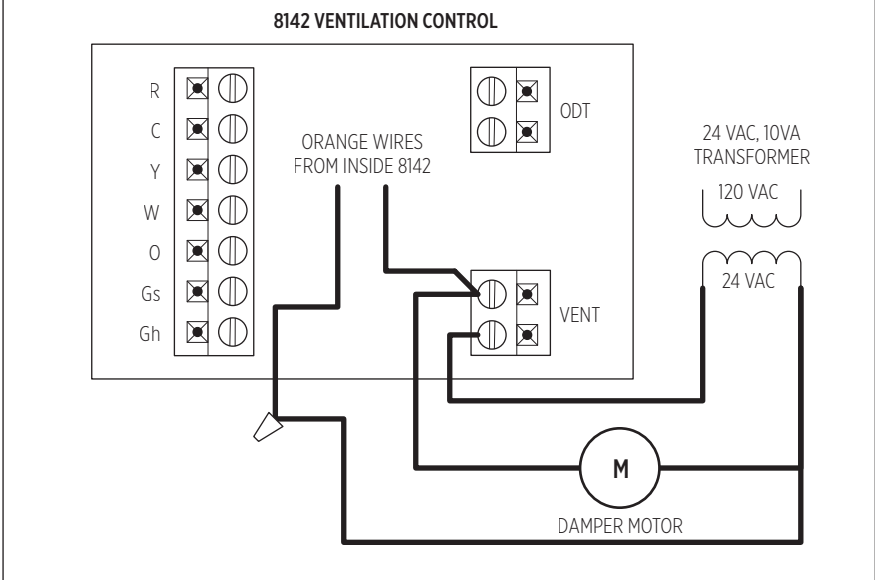


FIGURE 15 – WIRING A DAMPER TO THE 8142



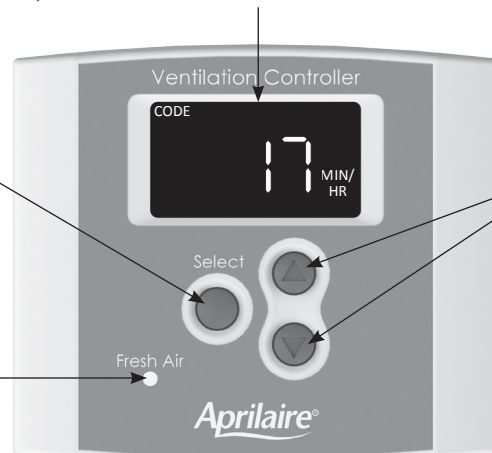
MODEL 8142 – OPERATION

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 for Rater/Inspector Verification. Press and hold for 5 seconds to enter Test Mode or Set Up Menu.

Lights green when ventilating.



Use to override the calculated ventilation time setting (6 – 60 minutes/hr). Press and hold ▼ to turn ventilation OFF.

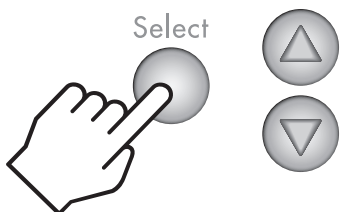
To return to the calculated setting, go completely through the Set Up Menu.

MODEL 8142 – SET UP

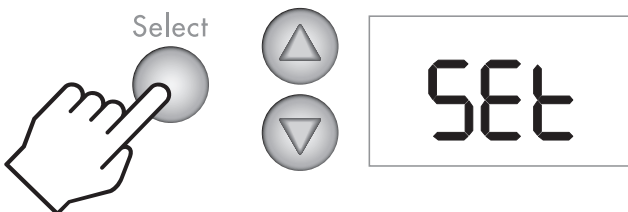
NOTICE

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

1 Hold for 5 seconds, then release.



2



Throughout the Set Up Menu, the ▲ 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 – MODEL 8142 SET UP MENU		
Menu Item	Values ▲▼	Description
	HP or HC	HP if wiring to a heat pump. HC if wiring to furnace and AC.
	1 – 10	Number of bedrooms – used to calculate required continuous ventilation rate.
	500 – 7500 ft ²	Square footage – used to calculate required continuous ventilation rate.
	30 – 250 CFM	Measured outdoor airflow delivered during ventilation.
	OFF, 85°F – 105°F	Ventilation high temperature limit. Ventilation is limited when the outdoor temperature exceeds the setting. Turn OFF if no high limit is desired.
	OFF, -10°F – 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.
	On, “bLnd”, 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.

TABLE 1 – MODEL 8142 SET UP MENU		
Menu Item	Values ▲▼	Description
	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.
	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”, “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.
	OFF, 45% – 70% RH	Only available when cFrT is selected. When the outdoor RH exceeds the setting, ventilation will not occur.
	OFF, 10% – 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 **donE**.

MODEL 8142 – 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.

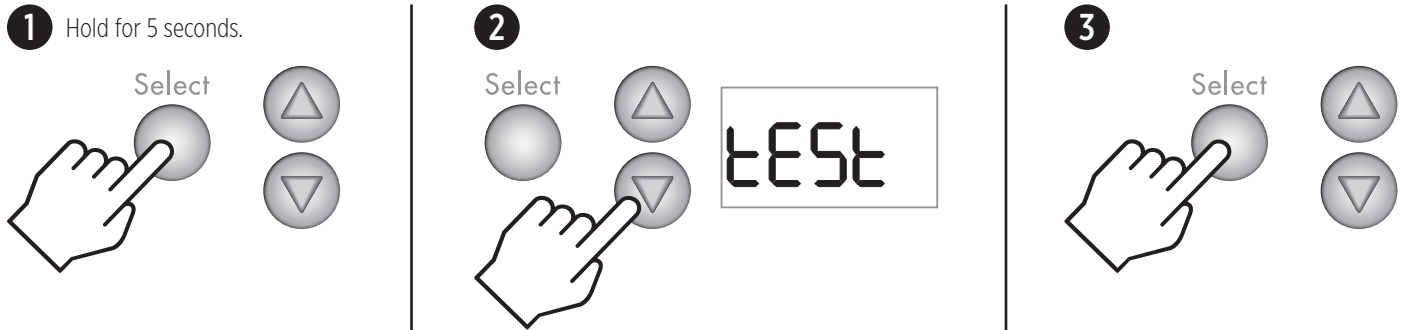
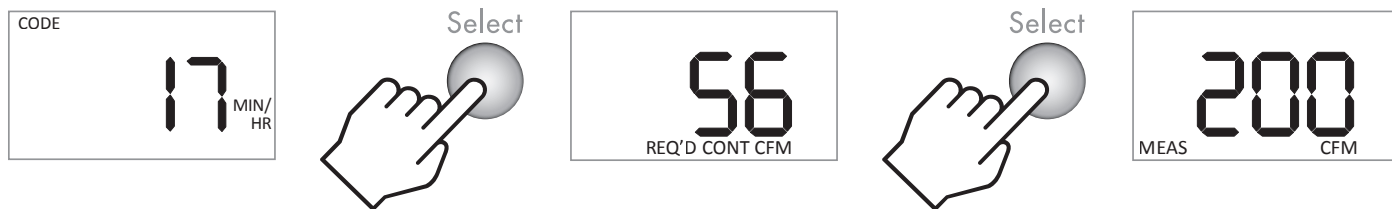


TABLE 2 – MODEL 8142 TEST MODE MENU

Test Sequence	Description
	Shows ---- °F to indicate that no separate outdoor temperature sensor has been installed. Model 8142 installations do not require a separate sensor – outdoor temperature is measured by the control's on-board sensor.
	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.
	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 .
	After 45 seconds Test Mode automatically completes and the display returns to the operating display.

MODEL 8142 – 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):

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

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

$$\text{Required Continuous CFM} = ((\text{Floor Area ft}^2 * .01) + (\text{No. of Bedrooms} + 1) * 7.5)$$

MODEL 8142 – 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.

LIMITED WARRANTY

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

Research Products Corporation'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 Research Products Corporation, Madison, Wisconsin 53701, together with the model number and installation date of the ventilator.

THIS WARRANTY SHALL NOT OBLIGATE RESEARCH PRODUCTS CORPORATION 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. RESEARCH PRODUCTS CORPORATION'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 www.aprilaire.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: Research Products Corporation, P.O. Box 1467, Madison, WI 53701.

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



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10012436 B2207655A 7.17