Aprilaire®

Ventilation Control System
Model 8126

Thank you for purchasing the Aprilaire® Ventilation Control System. Inside this carton you will find the following items:

Aprilaire® Ventilation Controller
Aprilaire® Normally-Closed Damper
Aprilaire® 24VAC Transformer

For the installer, there are two sets of 'Installation and Safety Instructions': one inside the Controller carton and one inside the Damper carton. **It is important that the installer read <u>both</u> sets of instructions before installing the product.**

For the homeowner, there is an 'Owner's Manual' inside the Controller carton. The 'Owner's Manual' provides important operational and warranty information.

Setting the Ventilation Controller

Ventilation Time Setting (min./ hr.)

House Size	Bedrooms			
(square feet)	2	3	4	5
1000-1500	15	20	25	25
1501-2000	20	25	25	30
2001-2500	20	**25**	30	30
2501-3000	25	30	30	35
3001-3500	25	30	35	40

As an example, for a 2500 square foot home with 3 bedrooms set the controller to 25 minutes of ventilation per one-hour cycle.

<u>Notes:</u>

1. Based on proposed ASHRAE 62.2P ventilation requirement.
2. Based on fresh air duct of 20' long flex duct, 0.08 in. w.c. static pressure at fresh air duct.
3. Based on the default setting of one hour Cycle Time. Use Cycle Time settings of 2, 3 or 4 hours where longer run times or less frequent operation is preferred. Adjust Ventilation Time accordingly. (In the above example set the Ventilation Time to 50 minutes and the Cycle Time to 2 hours.)

A longer fresh air intake duct or lower return static will increase the Ventilation Time required. Additionally, local codes may affect the Ventilation Controller setting. For more detailed guidelines, please see our website at **<u>www.aprilairecontractor.com</u>** or call us at (800) 334-6011.

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VENTILATION CONTROLLER
SAFETY & INSTALLATION INSTRUCTIONS

READ COMPLETE INSTALLATION INSTRUCTIONS AND TEMPLATE BEFORE STARTING.

Attention Installer: **WARNING** This product must be installed by a qualified heating and air conditioning contractor. Failure to do so could result in serious injury from electrical shock.

WARNING

1. 120 volts may cause serious injury from electric shock. Disconnect electrical power to the furnace before starting installation.
2. Sharp edges may cause serious injury from cuts. Use care when cutting plenum openings and handling ductwork.

CAUTION

1. Do not mount the Ventilation Controller on the supply plenum or duct. The unit will not withstand the supply temperatures.
2. When installing the Ventilation Controller on downflow furnaces, ensure blower continues to run after a heat call is satisfied to eliminate high temperatures from damaging the Ventilation Controller.
3. Do not mount the Ventilation Controller downstream of a fresh air intake, humidifier or bypass outlet. False humidity conditions will cause the Ventilation Controller to operate incorrectly.

STEP 1: UNPACK THE VENTILATION CONTROLLER CARTON

Make sure all components are present. (See Figure 1)

A. Model 8120 Ventilation Controller ('Controller')

B. Outdoor Temperature Sensor

C. "TIME ONLY" Resistor

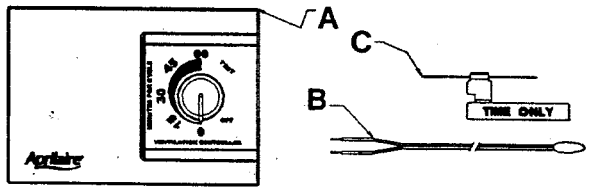


Figure 1. Carton Contents

STEP 2: SET THE CYCLE TIME INTERVAL

- Remove the knob by pulling it straight out from the Controller. Remove the cover by grabbing along the top and bottom edges of the cover and pulling straight out from the base.
- The jumper on the 5–pin header determines the cycle time interval. The interval can be 1, 2, 3, or 4 hours. (Default setting is 1 hour.) Refer to Figure 2.
- Move the jumper to desired interval. The jumper can be removed by pulling it straight out from the header pins.

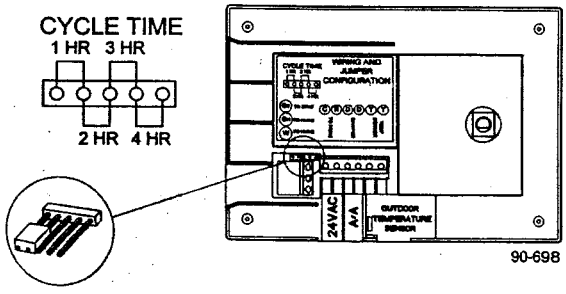


Figure 2. Cycle Time

STEP 3: DETERMINE LOCATION OF VENTILATION CONTROLLER AND MOUNT IT.
The Controller must be mounted in the return duct. For proper operation, the Controller must be at least 6 inches up-stream from the following:

- Fresh Air Intake Ductwork
- Humidifier
- Humidifier Bypass Ductwork

In installations where it's difficult to mount the Controller 6" upstream from the fresh air intake (when using a mixing box with flex duct returns for example) then mount the Controller as close to the main return duct as possible. Refer to Figure 3.

After the location for the Controller is selected, use the perforated Ventilation Controller Template (attached to these instructions) to mark the duct opening, and then cut it. Mount the Controller in the duct opening and make sure the Controller is sealed tightly to the duct.

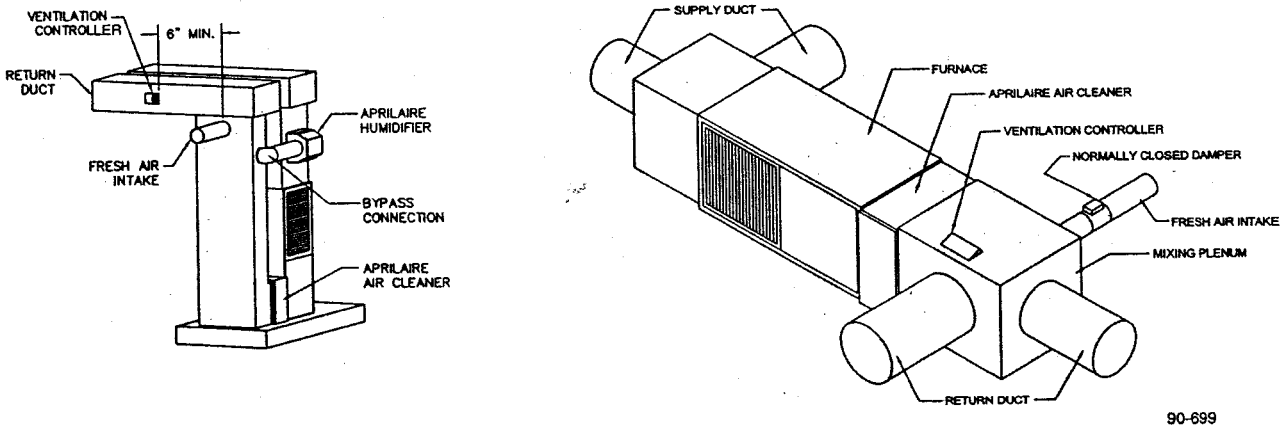


Figure 3. Typical Installations. Mount Controller AT LEAST 6" upstream from fresh air intake. Inside, or close to, the return duct is ideal.

STEP 4: CHOOSE MODE OF OPERATION
There are three modes of operation:

1. By connecting the Outdoor Temperature Sensor (see Figure 4), the Controller will use Outdoor Temperature and Indoor Humidity, along with the user-adjustable timer settings, to determine when to ventilate. **This is the recommended installation** as it uses all the advanced features of the Controller. For this installation, go to STEP 5.
2. By shorting the two Outdoor Temperature Sensor terminals with a standard 20-gauge wire (not provided), the Controller will disregard the temperature setting and base the ventilation on the indoor relative humidity and the user-adjustable timer settings.
3. By connecting the "TIME ONLY" resistor (provided) across the Outdoor Temperature Sensor terminals, the Controller will ignore outdoor temperature and indoor relative humidity and base ventilation simply on the time set by the installer/homeowner.

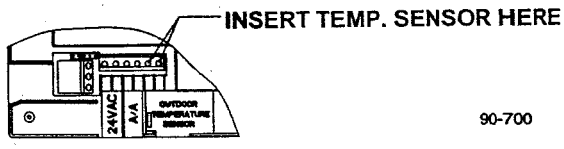


Figure 4. Outdoor Temperature Sensor Terminal

Refer to **Owner's Manual** for more details on the operation of the Controller.

STEP 5: LOCATION & WIRING OF OUTDOOR TEMPERATURE SENSOR

- The location of the temperature sensor should be in the Fresh Air Intake Hood (not provided) or in the Intake Duct, no more than 3 feet from the outside wall.
- The Outdoor Temperature Sensor is not affected by wire length. Do not route the wire alongside wires carrying high voltage (120 VAC or greater) as interference may occur.
- Strip wire 1/4 inches, and insert the wires from the sensor into the terminals labeled "Outdoor Temperature Sensor" on the Ventilation Controller. See Figure 5 for terminal locations.

STEP 6: WIRE VENTILATION CONTROLLER TO HVAC EQUIPMENT

NOTE: When installing the Ventilation Controller in a system with a power-stealing thermostat, it is recommended that load resistors be placed across Y and C terminals as well as W and C terminals.

CAUTION - Improper wiring to the HVAC equipment could cause damage to the Ventilation Controller and/or the HVAC equipment.

- Route wire from the R, C, W, and GHVAC terminals on the Ventilation Controller to the corresponding terminals on the furnace/heat pump control board. See Figure 5 for the terminal locations.
- Route a wire from the GSTAT terminal on the Ventilation Controller to nearby the furnace/heat pump control board but do not connect it. Instead, on the furnace/heat pump control board, disconnect the G wire that comes from the thermostat, and use a wire nut (not provided) to connect the G wire from the thermostat to the GSTAT wire from the Ventilation Controller. **NOTE: The only wire connected to the G terminal on the furnace/heat pump control board should be the GHVAC wire from the Ventilation Controller.**

STEP 7: INSTALL AND WIRE DAMPER

- The Aprilaire Normally Closed Damper (Model 6506) needs to be installed into the Fresh Air Intake. It should be wired in series with a continually energized 24 VAC transformer Model 4010 and connected to the terminals labeled "A/A" of the Ventilation Controller. (See Figure 5.)
- When done with all wiring, put the cover back on the Controller and slide the knob onto the shaft.
- In addition to these instructions, follow all installation instructions that are supplied with the damper.

WIRE DIAGRAM VENTILATION CONTROLLER

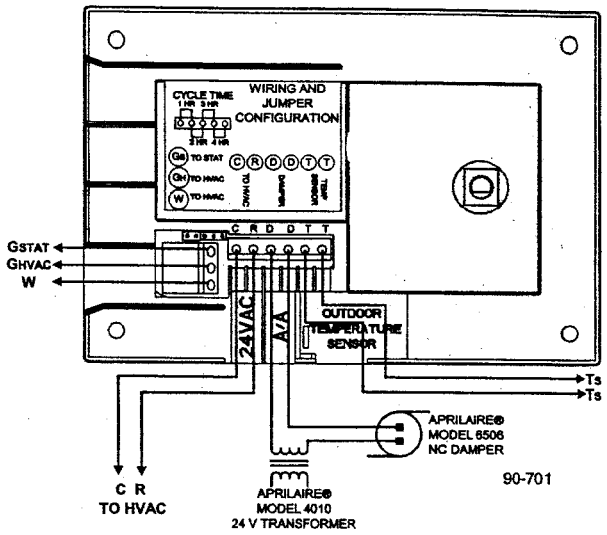


Figure 5. Wiring Diagram

STEP 8: SETTING THE VENTILATION TIME

- The knob on the exterior of the Controller (see Figure 6) is used to set the ventilation time within the cycle time interval you set in STEP 2.
- The knob settings range from "OFF" which is all the way counter-clockwise, to "TEST" which is all the way clockwise. Within those two extreme settings, the ventilation can be set from 0 to 60 minutes of ventilation time. For example: if you set the cycle time to 1 hour and the ventilation time knob to 20 minutes, you will get 20 minutes of ventilation every hour. See **Owner's Manual** for more details on operation.

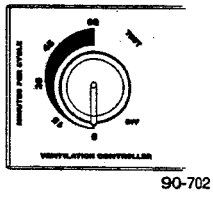
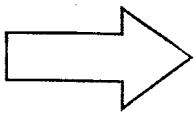


Figure 6. Ventilation Time

STEP 9: SYSTEM CHECKOUT

1. For system test, be sure that 24 VAC is applied in series with the Aprilaire® Normally Closed Damper (Model 6506) and connected to the "A/A" terminals on the Ventilation Controller.
2. Check the wiring to the Furnace/Heat Pump described in STEP 6.
3. Rotate the control knob clockwise to the "TEST" position.
4. If all is set up properly, the blower will turn on and the damper will open. The blower will remain on and the damper will remain open for 1 minute or until the knob is removed from the test position, whichever happens first.
5. If the damper or blower does not activate in TEST Mode, refer to the Troubleshooting Guide.
6. Rotate the knob to the desired ventilation setting. Note: do not leave the knob in the "TEST" position as the Controller will not operate after the 1 minute test sequence is over.

Perforated Ventilation Controller Template



INSTALLATION TEMPLATE

WARNING

Sharp edges may cause serious injury from cuts. Use care when cutting plenum openings and handling ductwork.

CAUTION

1. Do not mount the Ventilation Controller on the supply plenum or duct. The unit will not withstand the supply temperatures.
2. When installing the Ventilation Controller on downflow furnaces, ensure blower continues to run after a heat call is satisfied to eliminate high temperatures from damaging the Ventilation Controller.
3. Do not mount the Ventilation Controller downstream of a fresh air intake, humidifier or bypass outlet. False humidity conditions will cause the Ventilation Controller to operate incorrectly.

VENTILATION CONTROLLER TROUBLESHOOTING GUIDE

SYMPTOM	TROUBLESHOOTING PROCEDURE
HVAC Blower does not turn on in "TEST" Mode.	• Make sure there is power to the HVAC Equipment. • Check the wiring diagram for the R, C, W, and GSTAT and GHVAC at both the HVAC Equipment and the Ventilation Controller. • Make sure the supplied Temperature Sensor, the supplied resistor, or a jumper wire is connected to the Outdoor Temperature Sensor terminals. If nothing is connected to these terminals, the Ventilation Controller will not function. • Check the voltage across the R and C terminals at the Ventilation Controller. Voltage should be 22 VAC minimum—30 VAC maximum. • In "Test" Mode, the blower will activate for 1 minute, DO NOT LEAVE IN TEST MODE AS VENTILATION CONTROLLER WILL NOT OPERATE.
The Damper does not open in "TEST" Mode.	• Follow all of the above procedures. • Check the wiring diagram for the damper/24 VAC transformer.
The Ventilation Controller operates continuously after the knob is taken off "TEST" Mode.	• If the HVAC equipment is making a Heat or Cool call, or the Fan is in Continuous Operation, the Ventilation Controller will remain on until the ventilation requirement set by the interval jumper and knob is met. • If the interval is set at 1 HOUR and the Ventilation Time is set at 60 minutes, the Ventilation Controller will be on always. Change the ventilation setting to a lower amount if this is not desired.
The Damper does not open when the fan is active.	• The damper will not open if the ventilation time within the current interval has already been met. For instance if the ventilation knob is set to 5 MINUTES and the Ventilation Controller has already ventilated for 5 minutes in that interval, the damper will remain closed. • If the Indoor Relative Humidity is above 60% and the Outdoor Temperature is above 50°F, the damper will not open due to High Humidity conditions inside the house, or the potential thereof. • If the Outdoor Temperature is below 0°F or above 100°F, the damper will remain closed for energy efficiency. • If using the Outdoor Temperature Sensor, check that it is installed a maximum of 3 feet from the outside in the Fresh Air Intake or on the North, East, or West Side of the house. (Not in direct sunlight) • Make sure the Ventilation Controller is at least 6 inches upstream from the Fresh Air Intake, in the return duct.
The Fan turns on unexpectedly.	• The Ventilation Controller will turn on the fan as needed to meet the ventilation requirements determined by the Cycle Time and Ventilation knob setting.

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Call toll-free 1-800/334-6011 • Fax 608/257-4357

Form #100059
Printed in U.S

Aprilaire®

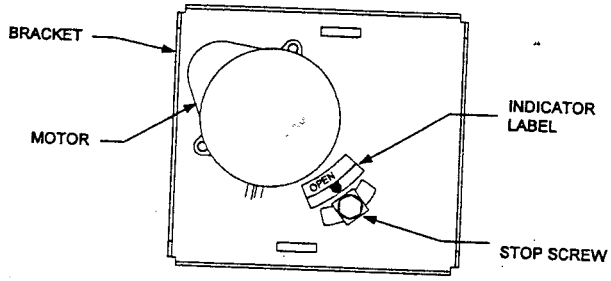
Fresh Air Intake Installation Instructions

CAUTION

1. **Sharp edges may cause serious injury from cuts. Use care when cutting openings and handling duct work.**
2. **Install dampers in fresh air duct only, and as close to the return duct as possible.**
3. **Do not force damper blades by hand, as damage may occur.**

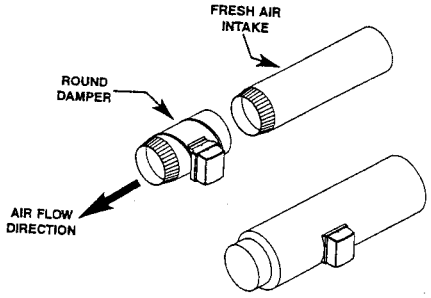
The damper blade, as supplied, is in the closed position. The damper is 12 VA at 24 VAC power-opened/spring-closed.

APRILAIRE DAMPER



(Shown with Plastic Cover Removed)

INSTALLATION PROCEDURE



Step 1: Install damper with crimped end downstream.

Step 2: Slide damper over end of crimped duct and secure to duct with 1/2 long sheet metal screws (not included).

Step 3: The fresh air intake ductwork and damper must be fully insulated and all seams must be sealed to prevent condensation from forming.

NOTE: Support all duct work in accordance with local code or SMACNA standards.

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If the 'TIME ONLY' resistor is used in place of the Outdoor Temperature Sensor, the Controller's operation is determined by the adjustable timer settings only – the Controller does not limit the operation based on the temperature and humidity limits shown in Figure 3.

If a jumper wire is used in place of the Outdoor Temperature Sensor, the Controller will disregard the temperature setting and base the ventilation on the indoor relative humidity and the user-adjustable timer settings. In this application, the Controller will not ventilate when the indoor relative humidity rises above 55%.

IV. LIMITED WARRANTY

Your Research Products Corporation Aprilaire® Ventilation Controller is expressly warranted for two (2) year from date of installation to be free from defects.

Research Products Corporation's exclusive obligation under this warranty shall be to supply, without charge, a replacement for the Controller which is found to be defective within two (2) year period and which is returned not later than thirty (30) days after said two (2) year period by you to either your original supplier or to Research Products Corporation, Madison, Wisconsin 53701, together with the installation date of the Controller.

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 CONTROLLER ITSELF.

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFORESAID ONE 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 DEFECT(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

Please... Take a few minutes to visit us on-line at
www.aprilaire.com
to register your Aprilaire product.

If you do not have on-line access, please mail a postcard with your name, address, phone number, product purchased and date of purchase to:

Research Products Corporation
P.O. BOX 1828
Madison, WI 53701

Thank you!

Your Warranty Registration information will not be sold or shared outside of this company.

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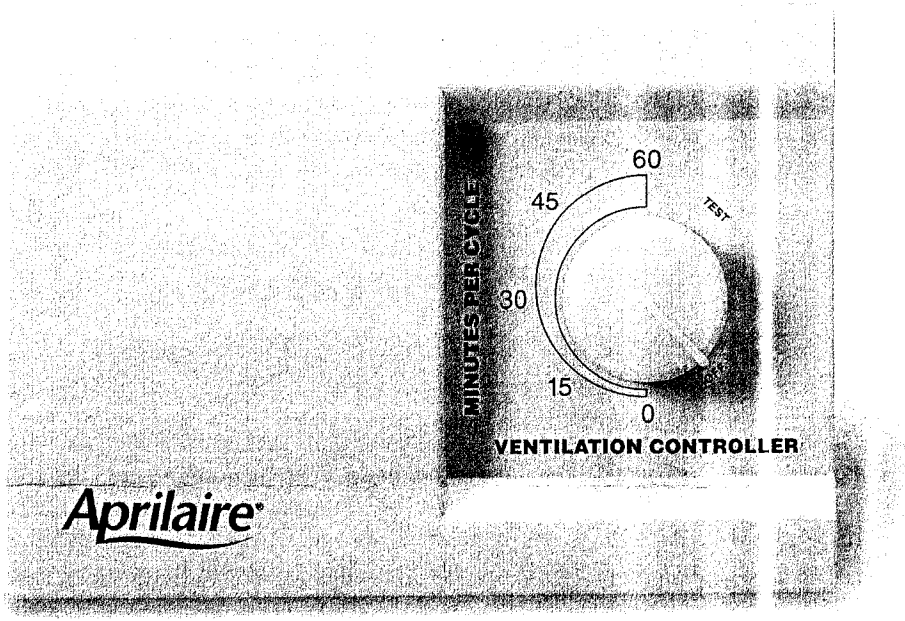
Aprilaire®

Ventilation Controller



Model 8120 Ventilation Controller
Owner's Manual

Includes Safety & Operating Instructions and Warranty Information

WARNING 120 volts may cause injury from electrical shock. Disconnect power before servicing.

CAUTION Sudden operation may cause personal injury or property damage. Turn Ventilation Controller to "OFF" before servicing.

READ AND SAVE THESE INSTRUCTIONS

I. PRINCIPLE OF OPERATION

With your purchase of the Aprilaire® Ventilation Controller, you have invested in an intelligent way of providing fresh air to your home. Working in conjunction with an Aprilaire® Damper, the Ventilation Controller makes decisions regarding when – and how long – to ventilate. It does this through continuous monitoring of indoor relative humidity, outdoor temperature, and user-adjusted timer settings.

Indoor relative humidity is monitored to help prevent high humidity conditions inside your home. The Aprilaire® Ventilation Controller will not open the damper to the outside air if there is a chance of raising the humidity inside the house to high levels. The Aprilaire® Ventilation Controller is designed to prevent indoor relative humidity levels from increasing beyond 60% due to ventilation.

If the outdoor air temperature is below 0°F or above 100°F, the motorized normally-closed damper to the outside will not be opened. This feature can be disabled at installation if the installer chooses not to use outdoor air temperature as a parameter.

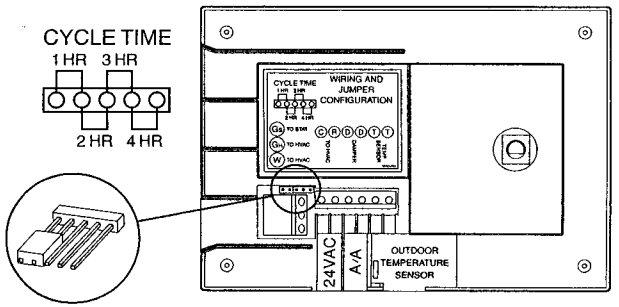
II. OPERATING INSTRUCTIONS

Your Ventilation Controller is installed in the return duct of your furnace or heat pump. There are two settings that are adjustable: the **cycle time** and the **ventilation time** within cycle. Here's how this works: if you set the **cycle time** to 1 hour and the **ventilation time** knob to 20 minutes, you will get 20 minutes of ventilation every hour. It is important to understand that the ventilation requirement – 20 minutes per hour in this example – may be satisfied by a heating, cooling, or fan call initiated by your thermostat, **or** from a fan call initiated by the Ventilation Controller itself. The following steps explain how to adjust these settings.

1. SETTING THE CYCLE TIME INTERVAL

- Remove the knob by pulling it straight out from the controller. Remove the cover by grabbing along the top and bottom edges of the cover and pulling straight out from the base. Refer to Figure 1 to locate the cycle time header & jumper.

FIGURE 1 – Cycle Time



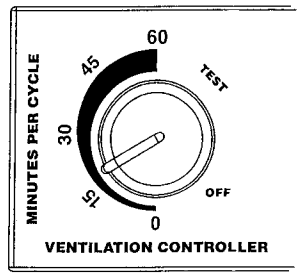
- The jumper on the 5 pin header determines the cycle time interval. The interval can be 1, 2, 3 or 4 hours. (The default setting is 1 hour.)
- Move the jumper to the desired setting. The jumper can be removed by pulling it straight out from the header pins.
- Snap the cover back on the controller and slide the knob onto the shaft.

2. SETTING THE VENTILATION TIME

- The knob on the exterior of the controller is used to set the ventilation time within the interval you set in Step 1.
- The knob settings range from "OFF" which is all the way counter-clockwise, to "TEST"† which is all the way clockwise. While labeled in 15 minute increments, the controller may be adjusted within the 15 minute interval to the nearest minute.

† Test mode is used to check the device at installation. In Test mode the Ventilation Controller activates the HVAC fan and opens the damper for one minute or until the knob is taken off the "Test" setting, whichever occurs first. After the minute has passed, the Ventilation Controller will not work until the knob is taken off "Test."

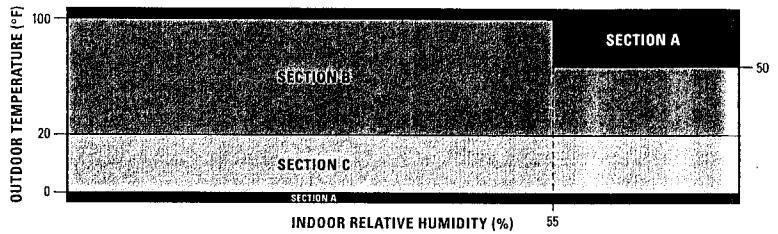
FIGURE 2 – Ventilation Time



III. OUTDOOR TEMPERATURE & INDOOR HUMIDITY CONTROL LIMITS

In a standard installation, your Aprilaire Ventilation Controller will use measurements of Outdoor Temperature and Indoor Humidity, along with the user-adjustable timer settings, to determine when to ventilate. Outdoor Temperature is measured with a sensor placed at the inlet of the fresh air intake duct. Indoor Humidity is measured in the return duct with a sensor built into the Controller. In conjunction with the timer settings, the Controller then operates according to the temperature and humidity control limits shown in Figure 3 below.

FIGURE 3 – Model 8120 Operating Limits



SECTION A: Controller will not ventilate due to temperature extremes
SECTION B: Controller will ventilate according to timer settings
SECTION C: Controller will ventilate only when heating is on according to the timer settings

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